



Towards Socially Integrative Cities

Perspectives on Urban
Sustainability in Europe
and China

Edited by:
Bernhard Müller;
Jian Liu;
Jianming Cai;
Paulina
Schiappacasse;
Hans-Martin
Neumann;
Baojun Yang

Towards Socially Integrative Cities

Bernhard Müller, Jian Liu, Jianming Cai,
Paulina Schiappacasse, Hans-Martin Neumann
and Baojun Yang (Eds.)

Towards Socially Integrative Cities

Perspectives on Urban Sustainability in
Europe and China

MDPI • Basel • Beijing • Wuhan • Barcelona • Belgrade • Manchester • Tianjin • Tokyo • Cluj



EDITORS

Bernhard Müller
Technische Universität Dresden (TUD),
Dresden, Germany

Jian Liu
Tsinghua University,
Beijing, China

Jianming Cai
IGSNRR, Chinese Academy of
Sciences (CAS),
Beijing, China

Paulina Schiappacasse
Technische Universität Dresden (TUD),
Dresden, Germany

Hans-Martin Neumann
Austrian Institute of Technology (AIT),
Vienna, Austria

Baojun Yang
China Academy of Urban
Planning and Design (CAUPD),
Beijing, China

EDITORIAL OFFICE

MDPI
St. Alban-Anlage 66
4052 Basel, Switzerland

For citation purposes, cite each article independently as indicated below:

Author 1, and Author 2. 2021. Chapter Title. In *Towards Socially Integrative Cities. Perspectives on Urban Sustainability in Europe and China*. Edited by Bernhard Müller, Jian Liu, Jianming Cai, Paulina Schiappacasse, Hans-Martin Neumann and Baojun Yang. Basel: MDPI, Page Range.

ISBN 978-3-03936-678-1 (Hbk)

ISBN 978-3-03936-679-8 (PDF)

doi.org/10.3390/books978-3-03936-679-8

© 2021 by the authors. Chapters in this volume are Open Access and distributed under the Creative Commons Attribution (CC BY 4.0) license, which allows users to download, copy and build upon published articles, as long as the author and publisher are properly credited, which ensures maximum dissemination and a wider impact of our publications.

The book taken as a whole is © 2021 MDPI under the terms and conditions of the Creative Commons license CC BY-NC-ND.

Contents

Acknowledgements	vii
Foreword	ix
Conceptual Basis, Urban Expansion and Land Management	
1 Urban Sustainability and Social Integration in Cities in Europe and China— An Introduction	3
BERNHARD MÜLLER, PAULINA SCHIAPPACASSE, JIAN LIU, JIANMING CAI, HANS-MARTIN NEUMANN AND BAOJUN YANG	
2 Towards a Common Understanding of Socially Integrative Cities in Europe and China	19
PAULINA SCHIAPPACASSE, BERNHARD MÜLLER AND JIANMING CAI	
3 Managing Urban Expansion in Europe: New Impulses for People-Centred Development in China?	45
PAULINA SCHIAPPACASSE, BERNHARD MÜLLER, JIANMING CAI AND ENPU MA	
4 Land Management for Socially Integrative Cities in Europe	83
JULIA SUERING, ANDREAS ORTNER AND ALEXANDRA WEITKAMP	
Socially Integrative Urban Regeneration	
5 Towards Socially Integrative Urban Regeneration—Comparative Perspectives from China and Europe	105
STEFANIE ROESSLER, JIANMING CAI, JING LIN AND MENG FAN JIANG	
6 Community Building through Public Engagement: Variety in Europe and China	131
THEA MARIE VALLER, MARIUS KORSNES, JIAYAN LIU AND YULIN CHEN	
7 Transformative Factors of Post-Industrial Urban Spaces in China and Italy	153
BADIAA HAMAMA, MARIA PAOLA REPELLINO, JIAN LIU AND MICHELE BONINO	
8 Looking at Socially Integrative Cities through the Educating City: The Example of Educational Museums in Europe and China	175
FABRIZIO D'ANIELLO, ZHUQING XU, ELISABETTA PATRIZI AND STEFANO POLENTA	
9 The Role of Heritage in Building a Socially Integrative City: A Comparative Approach	191
LISBET SAUARLIA AND YU WANG	
Urban Transformation and Evidence-Based Decision Making	
10 Embracing Complexity Theory for Effective Transition to Socially Integrative Cities	207
EDNA PASHER, LEE SHARIR, OTTHERN HERZOG, YAHEL NUDLER, BUYANG CAO, ZHIQIANG WU AND MOR HARIR	

11	Enhancing Capacity Building for Urban Transformation as a Means to Close the Planning–Implementation Gap in Europe and China SUSANNE MEYER, CHRISTOPH BRODNIK, GUDRUN HAINDLMAIER, HANS-MARTIN NEUMANN, DAIVA JAKUTYTE-WALANGITANG, JIANMING CAI, YAN HAN AND JING LIN	221
12	Social Cost–Benefit Analysis—Supporting Urban Planning and Governance for Enhancing Social Integration ANDREA RICCI, RICCARDO ENEI AND ENPU MA	257
13	Regression Analyses of Air Pollution and Transport based on Multiple Data Sources – A Decision Support Example for Socially Integrative City Planning MINGYUE LIU, BUYANG CAO, MENG FAN CHEN, OTTHEIN HERZOG, EDNA PASHER, ANNEMIE WYCKMANS AND ZHIQIANG WU	273
14	Estimating the Replication Potential of Urban Solutions for Socially Integrative Cities LORIANA PAOLUCCI	291
15	Urban Living Labs as Instruments of Open Innovation: Examples of Sino–European Cooperation ANNEMIE WYCKMANS, YUWANG, MARIUS KORSNES, PÅL AUNE, YANG YU, CHANG LIU, EDNA PASHER, MOR HARIR, LEE SHARIR, OTTHEIN HERZOG, BUYANG CAO, NIKOLAOS KONTINAKIS AND ANTHONY COLCLOUGH	317
	Abstracts	333
	Contributors	343

Acknowledgments



This book is based on the results of the TRANS-URBAN-EU-CHINA project. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770141. The material presented in this book reflects only the authors' views. It does not reflect the official opinion of the European Commission. The TRANS-URBAN-EU-CHINA project or the European Commission are not liable for the contents of the chapters or any use that may be made of the information contained therein.

Foreword

Since the Joint Declaration on “The EU-China Partnership on Urbanisation” in 2012, there has been a rapidly growing number of systematic joint research activities on sustainable urbanisation between European and Chinese partners. The “EU-China Sustainable Urbanisation Flagship Initiative” identified four priority areas of mutual interest for EU–China research and innovation collaboration, i.e., sustainable development and urban planning, nature-based solutions for cities, green urban mobility and sustainable energy solutions for cities.

Within this framework, the TRANS-URBAN-EU-CHINA research and innovation action started in 2018 with two parallel objectives. On the one hand, it aimed to support policy makers, urban authorities, real estate developers, public service providers and citizens in China to create socially integrative cities in an environmentally friendly and financially viable way. On the other hand, it aimed to help urban stakeholders in Europe to reflect and eventually reconsider their own approaches towards sustainable urbanisation. Real-world methods, instruments and good practice examples from Europe and China, e.g., in terms of social inclusiveness, cultural dynamics, environmental friendliness and economic viability, constituted a basis for comparative analysis.

Fourteen project partners of excellence conducted the project. With eight European and six Chinese expert organisations on socially integrative cities, TRANS-URBAN-EU-CHINA combined the best of both worlds to create new insights, practices and role models in sustainable urban development. The Chinese team of partners from government agencies and academia were able to exert a direct impact on society through their national responsibilities for regional and urban planning, research and education. The European partners played a similar role through their positions among European knowledge organisations.

The project started from the fact that cities are places of social innovation and engines of economic growth. They attract dynamic groups of society; they provide vast opportunities of interaction, communication and exchange of knowledge; and they thereby lay the foundation for attracting large shares of R&D investment and an innovative service sector. Social integration plays a special role here, as it is directly linked with the economic prosperity of cities, fair access to infrastructure and services, and the fair distribution of wealth and its amenities. This is true for urban development in general, but especially relevant for China as, promoted by various levels of government, the country is transitioning from a less urban to a more urbanised society with increasingly intensified land use and higher quality of life.

This book shares the impactful original research results of the project. It is the collaborative product of many stakeholders. It is also among the project’s

main comprehensive academically oriented results. All partners participated in its elaboration in a joint initiative. Mixed author teams, involving European and Chinese experts, are responsible for the individual chapters. Texts were internally reviewed by the editors, as well as further coordinated with the help of the respective work package leaders, who secured additional quality control. In this regard, special thanks go to Michele Bonino and Maria Paola Repellino from Politecnico di Torino (POLITO), Turin, Italy; Hans-Martin Neumann from the Austrian Institute of Technology (AIT), Vienna, Austria; Stefanie Rößler from the Leibniz Institute of Ecological Urban and Regional Development (IÖR), Dresden, Germany; Andrea Ricci from the Institute of Studies for the Integration of Systems (ISINNOVA), Rome, Italy; as well as Annemie Wyckmans and Wang Yu from the Norwegian University of Science and Technology (NTNU), Trondheim, Norway. All papers underwent an external peer-review process, organised by the publisher before final acceptance. We would like to thank the publisher, MDPI, for supporting the editors, and more than thirty reviewers for their critical reviews of the different chapters and useful comments.

We are confident that this online open access book provides new insights into recent urban development trends in China and Europe, and contributes to further discussions about ways to manage the transition towards urban sustainability through socially integrative cities. We would like to thank all concerned parties who made this book possible. Special thanks go to the European Commission, which supported the activities of TRANS-URBAN-EU-CHINA through the European Union's Horizon 2020 research and innovation programme under grant agreement no. 770141. Of course, the material presented in this book reflects only the authors' views. The European Union is not liable for any use that may be made of the information contained herein.

Bernhard Müller, Dresden, March 2021
(For the editors of the book)

Conceptual Basis, Urban Expansion and Land Management

Urban Sustainability and Social Integration in Cities in Europe and China— An Introduction

**Bernhard Müller, Paulina Schiappacasse, Jian Liu, Jianming Cai,
Hans-Martin Neumann and Baojun Yang**

1. Introduction

Europe and China share an old history of urban development. However, while Europe became a majority-urban continent already in the middle of the 20th century, China has turned primarily urban only about a decade ago. Moreover, in Europe, during the past 70 years, urban dynamics was and still is comparatively slow, as during this period, the share of the urban population has risen from 50% to only about 75% of the total population in 2020. It is expected to rise to 84% in 2050. On the contrary, China's urbanisation is unprecedented in speed and scale. The percentage of people living in urban areas skyrocketed from 20% to 50% in just three decades between 1980 and 2010. With a projected 71% in 2030 and 80% in 2050, the country is expected to almost reach the European level in the coming decades (United Nations 2018).

In absolute terms, this means that, since the year 2000, the urban population in China is growing by an average of more than 14 million persons every year, and in 2030, the country will have passed the mark of 1000 million urban dwellers. Thus, by then, every fifth urbanite worldwide will live in China (United Nations 2018). These figures underline the importance of urban development in China and the role of Chinese urbanisation in a global context. For many years, Chinese urbanisation has become a role model for many countries worldwide. Under the new "Belt and Road Initiative", revitalising the ancient Silk Route spirit within a modern context, it will probably continue, if not extend, to play a remarkable role in the urban world in the near future (CAUPD 2019).

Thus, in China and in other parts of the world, managing such rapid urbanisation processes is extremely challenging for policymakers and urban planners. Urban planning and development cannot be dealt with in an isolated way. They are closely connected with issues of collaborative urban–regional governance and comprehensive urban management, in general, putting emphasis on various dimensions of development, such as land use planning and management, resources for city financing, environment and urban economy, as well as social and cultural issues, at the same time. The provision of urban infrastructure facilities and public services

calls for balanced, integrated and participatory planning and development in order to avoid or minimise negative socio-economic, human and environmental repercussions.

According to the Horizon 2020 Framework Programme of the European Union, “joint European-Chinese research taking into consideration these essential elements of city development could contribute to an improved reciprocal knowledge on urbanisation processes between the EU and China”¹. Moreover, for at least three decades, many efforts have been made to manage urban expansion in a more sustainable way in Europe. They may provide useful references for conceptually enriching the still rather new “people-centred” urban development approach in China, introduced within the framework of the New-type Urbanisation Policy (NUP) in 2014, although the general frameworks and concerns about urban development are quite different in both parts of the world.

On this background, this chapter deals with major recent trends in urban development policies in the EU and China, and it provides a general overview of the contributions published in this book. The focus lies on socially integrative cities understood as “socially mixed, cohesive, liveable and vibrant” urban areas, which are characterised by a number of features. These include compactness, functional mix, intra-urban connectivity and equal rights regarding the access to municipal services, strengthening a sense of community and fostering a sense of place, as well as empowerment and participation of the population, and social capital (see Schiappacasse, Müller, Cai 2021 in Chapter 2 of this book). Inclusiveness is an important characteristic. However, the joint understanding of socially integrative cities is wider and more comprehensive. At the end of this chapter, some conclusions concerning the role of socially integrative cities regarding urban sustainability are drawn.

It has to be noted that when talking about “cities” in Europe and China, the understanding differs considerably. According to Eurostat, the European Statistical Office, a city in Europe is a local administrative unit with the majority of the population living in an urban centre of at least 50,000 inhabitants². It usually consists of a large continuous urban settlement, and it may comprise peri-urban settlements as well as some rural territory. The size in terms of area is usually rather limited. For example, the city with the largest area in Germany, Berlin, has a size of about 890 km². On the contrary, the Chinese word for “city” is typically used to describe a larger region including an urban core, sub-urban areas and vast rural areas containing smaller cities, towns and villages. As one extreme, the city of Chongqing covers an area

¹ Available online: <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/eng-globally-08-2016-2017> (accessed on 22 March 2021).

² Available online: <https://ec.europa.eu/eurostat/web/cities/spatial-units> (accessed on 22 March 2021).

almost the size of Austria. Beijing covers an area which is 19 times the size of Berlin. The city of Wuhan is more than three times the size of Luxemburg. Therefore, when we talk in this book about cities in Europe, we follow the above definition by Eurostat, while with regard to China, we usually refer only to the urban area of a “city”.

2. Recent Urban Policy Directions in Europe and China

The year 2020 marked an important point in urban Europe and China. In Europe, “The New Leipzig Charter—The transformative power of cities for the common good” (EU Ministers Responsible for Urban Matters 2020) was adopted at the Informal Ministerial Meeting on Urban Matters organised at the end of November in the city of Leipzig, Germany. It provides a key policy framework document for sustainable urban development in post-2020 Europe, and its title points to the leading role of cities in the years to come. In China, the 13th Five-Year Plan and the first phase of the new urbanisation policy, which had been heralded with the endorsement of the National New-type Urbanisation Plan (2014–2020), came to their end. Towards the end of 2020, the proposal of the Central Committee of the Chinese Communist Party on drawing up the 14th Five-Year Plan for national economic and social development and long-range objectives for 2035³ contoured the basic principles for future development (CSET 2020). In March 2021, the National People’s Congress (NPC) of China finally endorsed the 14th Five-Year Plan (2021–2025) (14th FYP) (NDRC 2021). It indicates that the basic urban policy principles and directions will continue to be a guideline for urban and regional development in China during the coming years.

2.1. Urban Europe and the New Leipzig Charter

In Europe, the New Leipzig Charter, focusing on the *transformative power of cities* for the common good, urges cities to establish integrated and sustainable urban development strategies and ensure their implementation at all levels of government and administration, i.e., from regional urban hinterland contexts to the very local ones at the neighbourhood level. The document summarises the European state of thinking in a comprehensive and consistent way. It calls for an urban policy of the common good, providing services and infrastructure which are inclusive, affordable and accessible for all. Furthermore, it acknowledges cities as places of pluralism, creativity and solidarity, and as laboratories for new forms of problem solving and test beds for social innovation. It promotes cities which are just, green and productive at the same time.

³ See the English translation of the document at https://cset.georgetown.edu/wp-content/uploads/t0237_5th_Plenum_Proposal_EN-1.pdf (accessed on 14 March 2021).

Just cities provide opportunities for everyone to integrate into society, leaving no one behind. “All social groups . . . should have equal access to services of general interest, including education, social services, health care and culture Socially balanced, mixed and safe urban neighbourhoods promote the integration of all social and ethnic groups and generations All citizens should be empowered to acquire new skills and education” (EU Ministers Responsible for Urban Matters 2020, p. 3).

Green cities contribute “to combatting global warming and to high environmental quality for air, water, soil and land use. The development of high quality urban environments for all includes adequate access to green and recreational spaces Cities are called on to protect and regenerate endangered ecosystems and their species and, to use nature-based solutions where high quality green and blue infrastructure can accommodate extreme weather conditions. Well-designed, managed and connected green and blue areas are a precondition for healthy living environments, adapting to climate change and preserving and developing biodiversity in cities” (EU Ministers Responsible for Urban Matters 2020, p. 4).

Productive cities promote a diversified economy, providing employment while ensuring a sound financial base for urban development. They require “a skilled workforce, social, technical and logistical infrastructure as well as affordable and accessible space. Ensuring these preconditions . . . should be integral to urban planning Small-scale businesses, low-emission-manufacturing and urban agriculture can be stimulated to re-integrate production into cities and urban areas, enabling and promoting new forms of mixed-use neighbourhoods. . . . Transforming central urban areas into attractive multifunctional spaces provides new opportunities for urban development through mixed use for living, working and recreation, where manufacturing, retail and services are found alongside housing, hospitality and leisure” (EU Ministers Responsible for Urban Matters 2020, p. 5).

Furthermore, the New Leipzig Charter highlights *digitalisation* as a major transformative, cross-sectoral force affecting all dimensions of sustainable urban development. “Digital solutions can deliver innovative and high-quality services to the public and businesses At the same time digitalisation can trigger a further spatial and social divide with risks to the protection of privacy. Digitalisation needs to be shaped in an environmentally sustainable, inclusive and fair manner” (EU Ministers Responsible for Urban Matters 2020, p. 5).

With a view on its implementation, the document calls for four important ingredients: (a) An *integrated approach* towards urban development shall help to coordinate all areas of urban policies. (b) *Participation and co-creation* shall secure the involvement of economic actors, the general public and other stakeholders in order to consider their knowledge, potentials and concerns in urban planning and development and to strengthen local democracy. (c) *Multi-level governance* shall guarantee that all societal stakeholders, including the government, civil society and

the private sector, will tackle the complex urban challenges jointly across all levels of decision making: local, regional, national and global. (d) A *place-based approach* shall contribute to appropriately considering the specific local situation as a reference point for integrated horizontal and vertical coordination, evidence-based urban development and endogenous urban transformation.

Overall, the New Leipzig Charter builds on former European urban policies, programmes and policy documents which were initiated in the early 1990s as reactions to perceived urban challenges. Among them were national initiatives such as “Soziale Stadt” in Germany (in English: “Socially Integrative City”), the “Single Regeneration Budget” and “The New Deal for Communities” in the UK, “Politique de la Ville” in France and “Programmi di Riqualificazione Urbana” in Italy. All of these initiatives not only focused on upgrading the built environment in cities but also directed much attention to social integration and the cohesion of urban societies. In addition to these national responses, the European Union introduced specific programmes towards urban regeneration (Urban I and II).

The New Leipzig Charter also goes far beyond its predecessor, the Leipzig Charter on Sustainable Urban Development of 2007 (European Commission 2007), which, basically, propagated two major directions of action, i.e., making greater use of integrated urban development approaches⁴, and directing special attention to deprived neighbourhoods of cities⁵. The New Leipzig Charter is based on the objectives and achievements of the Pact of Amsterdam (EU Ministers Responsible for Urban Matters 2016) and, thus, directly links with the Urban Agenda for the European Union and its multi-faceted initiatives for the years to come (European Commission 2019).

2.2. Urban China and 14th Five-Year Plan (2021–2025)

In March 2021, the Chinese People’s National Congress endorsed the 14th FYP following up on the prior proposal of the Central Committee of the Chinese Communist Party (NDRC 2021; see above). It defines the details of the plan for national economic and social development as well as long-range objectives through the year 2035. Among many other topics, it provides a framework as well as major guidelines and perspectives for the future development of cities in China, which play a crucial role in the country’s ambitious efforts on its way to “socialist modernisation”(CSET

⁴ Three components were addressed: creating and ensuring high-quality public spaces; modernising infrastructure networks and improving energy efficiency; and proactive innovation and educational policies.

⁵ Four components were addressed: pursuing strategies for upgrading the physical environment; strengthening the local economy and local labour market policy; proactive education and training policies for children and young people; and promotion of efficient and affordable urban transport.

2020, 1; NDRC 2021). On the one hand, the document highlights a number of *general objectives and principles*, which are basic for any future development in the country, including cities and their urban areas. On the other hand, it outlines *details* which are specifically relevant for *urban China*.

Similar to its predecessor, the 13th FYP, as well as the New-type Urbanisation Plan (2014–2020), the 14th FYP⁶ makes strong commitments towards certain *basic principles*. *People-centred development* puts the people, e.g., residents, at the centre of all government efforts. It calls for people’s engagement and for sharing the “fruits of development” by the people. The government commits itself to protecting the people’s fundamental interests, inspiring the enthusiasm, initiative and creativity of all people, promoting the well-being of the people and continuously realising people’s aspirations for better lives.

The 14th FYP reiterates the continuing high relevance of the *new concept of development*, which had been introduced before. This concept puts special emphasis on higher quality, efficiency, fairness and sustainability. It shall be applied in all fields throughout development processes. Furthermore, the government commits itself to continue its efforts regarding *institutional reforms*. Among other things, they shall help to strengthen the modernisation of the national governance system and respective capabilities, break down institutional barriers constraining *high-quality* development and high quality of life and support initiatives that help to increase the efficiency of resource allocation. Through its commitment to applying *systematic approaches*, the government intends to strengthen forward-looking thinking, overall planning, strategic positioning and holistic advancement. The initiatives of central and local governments and other spheres of society shall be better utilised. Accelerating *digitisation-based development* is seen as a key to successful modernisation of the country in all spheres.

Regarding urban development and related issues, the 14th FYP provides a number of important details regarding objectives and intended measures during the coming years. The plan clarifies that the *new-type urbanisation strategy* will persist and be refined. Special attention is given to *territorial cohesion*, i.e., more balanced regional development on a national scale. Inter-regional imbalances shall be tackled, and regional development shall be better coordinated. This includes new development incentives for Western China, revitalisation activities in the northeast of the country, additional development support for Central China and the modernisation of the economic urban powerhouses in the eastern part. A coordinated development of small towns and small, medium and large cities shall be promoted. New growth

⁶ If not otherwise mentioned, the text refers to either the original version in Chinese (NDRC 2021) or the English text of the proposal, published in CSET (2020).

poles shall be created. The inter-regional transfer payment system shall be refined, financial resources to support less developed regions shall be increased and, gradually, equitable access to public services shall be achieved all over the country.

On a regional scale, the further improvement and refinement of *urban–rural relations* are high up on the national agenda. Above all, this includes the continued and intensified reform of the *household registration system* (hukou), the traditional Chinese government’s tool for managing internal movement, which has strongly deepened the urban–rural divide over the past decades. The National New-type Urbanisation Plan noted that in 2014, although 53.7% of China’s population normally resided in urban areas, registered urban residents comprised no more than 36% (Chu 2020). Nowadays, rural migrant workers make up about 40% of the urban labour force. However, their rights and access to urban services are still, in many cases, severely restricted if compared to urban residents. This has had negative repercussions in rural and urban areas.

Another anchor to improve urban–rural relations is based in rural reforms and *rural revitalisation* initiatives. Among other things, this comprises the reform of the rural collective property rights system, and the improvement of integrated urban–rural development, including land development issues. Moreover, rural construction will play a more prominent role within modernisation efforts. Regional urban centres, e.g., county seats, shall help to promote rural urbanisation and take over functions as central places for their areas of influence. Infrastructure and services shall be further extended, improved and upgraded.

Promoting *people-centred urbanisation* is a core element of 14th FYP from a local urban development perspective. Within this framework, previous urban expansion approaches, population densities and spatial structures of cities shall be reconsidered. This connects well with efforts to protect farmland and ecologically valuable natural areas. Moreover, the government emphasises its intentions to give more prominence to *urban renewal strategies*, to enhance historical and cultural preservation and to strengthen the renovation of old urban residential areas and neighbourhoods. The supply of *affordable housing*, especially for renting, shall be increased. Environmental concerns are highlighted, supporting the so-called “ecological civilization” of the country. For example, the government intends to promote urban ecological restoration, to fashion urban landscapes, to increase urban flood control and drainage capabilities and to construct resilient “sponge” cities, a Chinese urban development concept based on the wise management of water.

From an institutional point of view, people-centred urbanisation includes efforts to improve and strengthen *urban governance*, and to follow a more *comprehensive approach* regarding urban planning, construction and management. Housing speculation shall be mitigated, which seems to be especially important in the light of the actual oversupply of housing, especially in rather high-priced market

segments. Furthermore, the government expresses its intention to refine mechanisms for distributing *income from land transfers*, hitherto a major source of budget revenue of cities, which has significantly contributed to the rapid and often oversized spatial expansion of cities in China if compared with population growth during the past decades.

These institutional moves link well with efforts to refine the national administrative system and to improve “*social governance*” significantly, especially at the grassroots level (CSET 2020, p. 7). It has to be noted here that social governance, or social management as it was formerly called (Yu 2011), is a prominent concept in the country with a specific Chinese flavour. It is “a systematic project under the leadership of the CPC Central Committee to safeguard the social harmony and stability by coordinating with all parties in the society” (Liu 2018). It encompasses all government dealings with society, excluding business management and administrative management. Its connotation “is so broad that it includes areas such as social justice, public security, social stability, social trust, the coordination of various social interests, food safety, emergency management, city management and community governance” (Yu 2011).

Within this framework, China already disposes of a rather powerful tool of institutionalised community engagement (Palmer et al. 2010). For example, there is the institution of the Urban Residents Committee, i.e., “a mass organization for self-government at grassroots level” (Ministry of Commerce People’s Republic of China 1989, Article 2), forming the lowest level of the administrative hierarchy. Originally created in 1954 to ensure neighbourhood monitoring, urban residents’ committees started to provide social services for those in need since the economic reform in the late 1970s.

However, more recently, “residents’ committees . . . saw themselves as having to provide both administration . . . and services . . . ” (Audin 2015, p. 1). In practice, they handle public welfare services and assistance, provide public education and security and transmit the opinion and demands of residents to higher authorities. They have also proved their effectiveness regarding public health during the SARS epidemic in 2002–2003, and the COVID-19 crisis in 2020. In the future, they could play a more powerful role in enhancing social integration within the framework of urban planning and development of new neighbourhoods. However, until now, they have not been directly linked with urban planning and development, and they have limited capacities to promote lively, socially vibrant, open and mixed local communities (Audin 2015; Ma and Li 2012); see also Schiappacasse, Müller, Cai, 2021 in this volume).

From a Western perspective, social governance comes close to concepts of *public participation*, interaction between the state and civil society (organisations) and mechanisms of self-government at the local level. Referring to cases in Hangzhou,

Yang et al. differentiate four types of civic engagement in their paper about social governance in China: substantial, ceremonial, propagandistic and absorptive civic engagement (Yang et al. 2016, p. 2157). These types compare well with Western concepts of participation, which have been derived from Arnstein's participation ladder (Arnstein 1969).

For the transformation towards more socially integrative cities, it is of utmost importance that the 14th FYP puts much weight on further *enhancing social governance, participation and empowerment at the local level* in China during the coming years. For example, it explicitly mentions "people's rights to equal participation and equal development will be fully assured" (CSET 2020, p. 4). Participation in policy formulation shall be promoted (NDRC 2021, chp. 22). The "centre of gravity" of social governance shall be shifted towards an empowered grassroots level. "Urban community governance" shall be strengthened through modernisation (CSET 2020, p. 25).

More specifically, the 14th FYP calls for a clarification of the functions and responsibilities of institutions at the community level, district and sub-district offices and neighbourhood committees. "Diverse institutional channels for residents to participate in social governance" shall be provided. The Plan also wants to "give full play to the social organisations in social governance, and fully stimulate the vitality of grassroots social governance."

It is difficult to say what these stipulations concretely mean for *public participation in urban planning and development* in the future. On the one hand, they may refer to general organisational principles regarding the engagement of the population at the local level only. On the other hand, they could provide a basis for sustainably strengthening the role of local public participation in urban planning and development. This could lead to more and broader consultation and debate, as well as to new forms of joint decision making regarding the future of cities. It would allow climbing up Arnstein's ladder of participation and strengthening substantial civic engagement in the sense of Yang, He and Long.

Summing up the major issues of the 14th FYP for urban development, we can conclude the following:

Although the term of the National New-type Urbanisation Plan (2014–2020) officially ended in December 2020, the principles set up in this document will obviously continue. That means attention will be paid to the people-oriented development to ensure equity, as well as balanced urban–rural and regional development, intensive and efficient land use, green, recycling and low-carbon development, in order to promote ecological civilisation, and cultural continuity to ensure local identity.

Following these principles, planning is oriented to people, liveability, sustainability and resource efficiency, with quality as the key term. That is also part of the reasons for the restructuring of the planning system from urban–rural planning

to territorial and spatial planning, with more attention directed to the protection of nature and the efficiency of resource uses, including land for construction.

In terms of practice, comprehensive urban renewal will become more significant in the future, probably more than urban expansion and new town or new area development. Rural revitalisation will keep its national significance, as well as coordinating regional development. Community building and social governance at the grassroots level, particularly the so-called complete daily life community, will be of increasing importance. The latter is one of the lessons cities and urban planners have learnt under the impression of the impacts of the COVID-19 crisis since early 2020.

3. Overview of the Book Chapters

On the background of the recent policy directions in Europe and China, this book can make timely contributions to the actual discussions about future perspectives of urban sustainability in both parts of the world. It touches on a number of central issues of the New Leipzig Charter and the Urban Agenda of the EU, on the one hand, and the New Urbanisation Policy and the 14th Five-Year Plan of the People's Republic of China, on the other hand. It deals with experiences and options to create socially integrative cities in Europe and China in a participatory way as a contribution to make cities more sustainable. It presents major original research results of a joint project of researchers and practitioners from fourteen European and Chinese institutions. It is multi- and interdisciplinary in nature, and it looks at a multitude of facets of the socially integrative city from different angles. The individual chapters can be grouped roughly into four parts.

3.1. Conceptual Basis, Urban Expansion and Land Management

The first set of chapters provides an overview of and insights into the conceptual basis of the book. The socially integrative city is framed by discussions in academia and practice, and it is defined in a comprehensive way as an element of urban sustainability. The management of urban growth processes in Europe and China and the principles of land management are presented as basic conditions shaping urban development.

Schiappacasse, Müller and Cai look for a common understanding and a suitable definition of socially integrative cities in Europe and China. First, they discuss the general relevance of the topic. Second, they trace respective approaches in Europe and China back to their origins. Third, based on expert group discussions, they present a comprehensive understanding of socially integrative cities, which comprises twelve characteristics grouped into five dimensions: collaborative urban planning and design; favourable urban environment and living conditions; vital local economy and labour market; solidary socio-cultural development and social capital;

and supportive institutional development and urban finance. Subsequent chapters refer to this general concept.

Schiappacasse, Müller, Cai and Ma look at ways to manage urban expansion in Europe and ask whether, from these experiences, new impulses can be derived for people-centred urban development in China. On the one hand, the article reviews urban expansion processes in China and Europe and looks at some European approaches oriented towards limiting urban expansion and promoting social integration. On the other hand, the authors show that European experiences, including model projects of participatory planning, may be inspiring for shaping future urban development and socially integrative urban expansion in China.

Finally, Suering, Ortner and Weitkamp focus on the importance of land in urban development. They deal with the role of land management for socially integrative cities. Their paper analyses land development in general, as well as related instruments and mechanisms in Europe. The authors are especially interested in instruments which can be used by municipalities for managing and shaping local land use. They demonstrate how these instruments may influence the provision of affordable housing as well as technical and social infrastructure.

3.2. Socially Integrative Urban Regeneration

A second set of articles focuses on socially integrative urban regeneration in cities. After an overview of policies and strategies in Europe and China, detailed aspects are discussed, such as community building through public engagement, challenges of place making and the role of education and life-long learning. Finally, a view on heritage preservation and its impact on social integration in urban regeneration concludes this part.

In their paper, Rößler, Cai, Lin and Jiang provide an overview of urban regeneration in China and Europe and its relation with social integration. The article focuses on the current framework, challenges and experiences of socially integrative urban regeneration in both parts of the world. In order to understand the specific challenges as well as potentials of urban regeneration strategies, the authors consider different pathways, origins and practices. This includes a comparative view on terms and definitions used in the debate as well as the current practice of urban regeneration. Drawing on the concept of socially integrative urban development, challenges of urban regeneration in China and experiences in Europe are described.

Valler, Korsnes, Liu and Chen look into community building through public engagement. They emphasise the role of public participation in the regeneration of neighbourhoods. However, they also demonstrate that the extent to which such processes are anchored in communities varies greatly. They attribute this to the groups of actors involved. Thus, they focus on the question of who participates in community building in Europe and China. The analysed cases show that there are

different levels of participation in Europe and China. The authors argue that a wide variety of actors should be involved early in local planning in order to ensure that residents have a say in the definition of the issues at hand.

Hamama, Repellino, Liu and Bonino discuss place making in post-industrial cities in China and Europe. Based on a literature review and selected case studies from China and Europe, the chapter embraces two transformative factors, people and places, to shed light on the processes behind the social and spatial transformation of urban spaces, the integration of the marginalised communities and the promotion of community participation in the preservation of the architectural and cultural heritage. The authors conclude that despite tremendous efforts to engage local communities in producing high-quality urban spaces, a number of challenges, such as gentrification, economic disparities and geographic segregation, are still hindering the realisation of socially integrative cities.

D’Aniello, Xu, Patrizi and Polenta look into the role of educational museums for creating socially integrative cities in Europe and China. They show how the idea of the “educating city” can help to find effective ways of social integration which have the potential to promote the well-being of individuals and the community. The authors analyse case studies of educational museums in Europe and China. They demonstrate that museums, as non-formal education spaces and an expression of collective identity, can play an important role in connoting a city as an educating city.

Sauarlia and Wang focus on the role of heritage in creating socially integrative cities. The authors look at the critical role of communities in the transition of historical urban districts. The authors compare two cases, i.e., a district in Trondheim, Norway, and one in the city of Xi’an, China. Both examples show that communities play an important role in transforming urban areas. The authors conclude that community building in urban transition is a key element for preserving the value of historical districts and neighbourhoods.

3.3. Urban Transformation and Evidence-Based Decision Making

A third set of articles looks into issues of urban transformation and evidence-based decision making. Transformation is understood as a complex set of interactions. Community platforms for information and dialogue can become effective instruments to facilitate transition processes. Community interaction and development as well as other features of transformative capacity can help to narrow gaps between planning and implementation. Advanced methods, such as social cost-benefit analysis (SCBA), may support social integration. Additionally, it is demonstrated that the use of multiple data sources can speed up the digital transition in cities and provide decision support for social integration.

Pasher et al. embrace complexity theory for discussing transition processes towards socially integrative cities. They understand the city as a living organism

in which resources, knowledge and people are closely interconnected. The authors point out that community building is a key factor for making cities more attractive for residents, businesses and visitors. Digital technology can contribute to establish lively online communication among inhabitants. The case of Tel Aviv in Israel can be taken as a good practice example for facilitating transformation processes.

Meyer et al. focus on capacity building for urban transformation. They discuss factors which influence the efficiency and consistency of urban planning in implementation, taking smart cities as an example. Case studies reveal that certain measures to enhance transformative capacities are critical across Chinese and European cities. For example, stakeholder involvement and the cooperation within a multi-actor community is key to reduce the gap between planning and implementation, both in China and Europe. Importantly, however, the case studies show that while there are commonalities regarding the role of certain transformative capacity building measures, the way these measures are expressed differs between Chinese and European cities and always embodies the local context.

Ricci, Enei and Ma present social cost-benefit analysis (SCBA) as an instrument to support urban planning and governance for enhancing social integration. SCBA techniques can be used for monetary valuation of impacts for which market prices may not be available. The quantification through SCBA techniques may help to better reflect the value which society attaches to non-market goods and services, enabling urban planners and policymakers to consider the net social welfare effects of urbanisation processes.

Liu et al. deal with a specific facet of attempts to enhance the quality of life and well-being of people. They take the mitigation of air pollution as an example. In their contribution, the authors present a study on interrelationships between air pollution, transportation, industries and social activities in Tianjin. The analysis identifies factors which have an impact on air quality in the city. A cost model for the reduction in air pollution provides insight into causal factors that may be taken into account while making decisions to lower air pollutants. With this example, the authors also demonstrate how multiple data sources can be used to establish decision support for planning socially integrative cities in an evidence-based way.

3.4. Replicability and Urban Laboratories

The final set of articles deals with questions of the replicability of experiences and the role of concrete urban experiments in so-called urban living laboratories. Methods to explore the replication potential of urban solutions for socially integrative cities are discussed, and the potential of urban living laboratories for nurturing open urban innovation in Chinese cities is scrutinised. Several examples are discussed, and conclusions regarding the enhancement of social integration in cities are drawn.

Paolucci describes a new method for estimating the replication potential of urban solutions for socially integrative cities (the SITEE replicability method). The author starts from the experience that a certain solution, which may be successful in a given context, does not necessarily work in a different context, bringing the same benefits. For example, measures successfully pursuing social integration in Europe may face various difficulties when implemented in a Chinese context. Thus, a thorough analysis of the replication potential is required. On this background, the author describes a new method for estimating the replication potential of urban solutions in different contexts, combining quantitative data with qualitative information collected from local stakeholders according to five dimensions: Socio-Cultural, Institutional, Technological, Environmental and Economic (SITEE). The multi-dimensional analysis allows describing and understanding the complexity of different contexts and helps to identify the most relevant factors that may limit or facilitate replication.

Finally, Wyckmans et al. discuss urban living labs as instruments of open innovation. Urban living labs, which are becoming increasingly popular in Europe, are still rather new in China. However, on-the-ground experiences in the cities of Wuhan, Tianjin and Jingdezhen, based on close interaction between local stakeholders and European and Chinese experts, demonstrate the potentials of urban living labs in China. The authors suggest applying open innovation-based principles so that urban living labs can function as meeting arenas to support communities' diversity, significance and connectedness, where participants can experiment with practical ideas and solutions towards a more cohesive, inclusive and sustainable everyday life.

4. Conclusions

Starting from major urban development trends in Europe and China, we have had a closer look at several key documents for shaping the urban future in both parts of the world. Comparing the stipulations of the New Leipzig Charter in Europe and the contents related to the 14th Five-Year Plan related to urban issues in China, we can conclude that urban policies in both parts of the world seem to head in similar directions.

Urban sustainability and territorial cohesion are general issues of concern. People-centred high-quality development shall guide future directions of urban areas. Community building, public participation and social governance at the local level will gain importance. Altogether, this may favour cities and urban areas in their efforts to become more socially integrative in the future, although one should carefully look at the basic cultural and conceptual differences between the two parts of the world, which may hamper mutual understanding and knowledge sharing.

Most chapters of this book are written by mixed European and Chinese teams. This shall help to avoid cultural and conceptual misunderstanding, although it never can be totally excluded. The contributions shall add new insights from Europe

and China to the discussion about socially integrative cities and their potential contribution to sustainable urban development.

Knowledge sharing, the exchange of experiences and good practice examples may help socially integrative cities to become a reality in more and more cases. We have seen that the basic documents in Europe and China pave the way for it. What is needed now is the will and capacity of all stakeholders in both societies, i.e., the state, the business sector, the civil society, media and academia, to seriously head in the direction of social integration, making cities and urban areas more people-oriented and securing future urban development at a human scale.

Author Contributions: B.M. is the main author of the article. He prepared all versions of the article, strongly supported by P.S. J.L. and J.C. provided inputs for the first draft. H.-M.N. and B.Y. commented on the final draft of the article.

Funding: This research was funded by the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 770141.

Acknowledgments: The authors of the article thank the authors of the book chapters for providing their abstracts, which were useful for describing the structure of the book. They would also like to thank Mengfan Jiang, TU Dresden, for her support regarding the text of the 14th Five-Year Plan of the People's Republic of China.

Conflicts of Interest: The authors declare no conflict of interest. The founding sponsors had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, and in the decision to publish the results.

References

- Arnstein, Sherry. 1969. A Ladder Of Citizen Participation. *Journal of the American Institute of Planners* 35: 216–24. [CrossRef]
- Audin, Judith. 2015. Governing through the neighbourhood community (Shequ) in China. *Revue Française de Science Politique* 65: 85–100. [CrossRef]
- CAUPD, ed. 2019. *Global Cities in the Vision of the Belt and Road Initiative*. Beijing: CAUPD.
- Chu, Yin-wah. 2020. China's new urbanization plan: Progress and structural constraints. *Cities* 103. [CrossRef]
- CSET. 2020. *Proposal of the Central Committee of the Chinese Communist Party on Drawing Up the 14th Five-Year Plan for National Economic and Social Development and Long-Range Objectives for 2030*. Beijing: Center for Security and Emerging Technology.
- EU Ministers Responsible for Urban Matters. 2016. *Establishing the Urban Agenda for the EU 'Pact of Amsterdam'*. Amsterdam: European Union.
- EU Ministers Responsible for Urban Matters. 2020. *The New Leipzig Charter*. Edited by European Union. Leipzig: European Union.
- European Commission, ed. 2019. *Urban Agenda for the EU. Multi-Level Governance in Action*. Brussels: European Union.
- European Commission. 2007. *Leipzig Charter on Sustainable European Cities*. Business: European Commission.

- Liu, Lihui. 2018. *Social Governance in China: The Role of Government and Transformation of Government Functions*. Edited by Institute of Public Administration and Human Resources. No. 85. Dublin: Institute of Public Administration and Human Resources.
- Ma, Weihong, and Linda Li. 2012. Community Governance Reform in Urban China: A Case Study of the Yantian Model in Shenzhen. *Journal of Comparative Asian Development* 11: 224–47. [CrossRef]
- NDRC, ed. 2021. *The Outline of the 14th Five-Year Plan (2021–2025) for National Economic and Social Development and the Long-Range Objectives Through the Year 2035*; Beijing: National Development and Reform Commission of China.
- Palmer, Neal A., Douglas D. Perkins, and Qingwen Xu. 2010. Social capital and community participation among migrant workers in China. *Journal of Community Psychology* 39: 89–105. [CrossRef]
- Ministry of Commerce People's Republic of China. 1989. *Organic Law of the Urban Residents Committees of the People's Republic of China*. Order No. 21. Beijing: Ministry of Commerce People's Republic of China.
- United Nations. 2018. *World Urbanization Prospects*. New York: Department of Economic and Social Affairs.
- Yang, Bao, Yufei He, and Wenjin Long. 2016. Alienation of Civic Engagement in China? Case Studies on Social Governance in Hangzhou. *Voluntas* 21: 2150–72. [CrossRef]
- Yu, Keping. 2011. A Shift towards Social Governance in China. *East Asia Forum*. September. Available online: <https://www.eastasiaforum.org/2011/09/09/a-shift-towards-social-governance-in-china/> (accessed on 19 April 2020).

© 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Towards a Common Understanding of Socially Integrative Cities in Europe and China

Paulina Schiappacasse, Bernhard Müller and Jianming Cai

1. Introduction

Segregation in cities, whether voluntary or forced, is a universal phenomenon, and it is as old as the city itself (Häußermann and Siebel 2001, p. 70). Consequently, integration also has a long history, at least since cities started to open broader opportunities for the population to participate in economic and social activities, deal with challenges of the concentration of social and economic challenges as well as other structural problems in certain districts or neighbourhoods, and promote social cohesion and inclusion.

The term “social integration” has been widely used in academia and practice, especially in the discussion about social segregation and ways to diminish its negative consequences in cities. Moreover, it has often been used in policy documents and related debates for decades. Nevertheless, there is a lack of clarity regarding its meaning and the ways to measure and operationalise it (Jeannotte 2008).

According to the United Nations (1994), there are at least three different ways of understanding social integration. First, integration is understood as inclusion, implying equal opportunities and rights for all humans. In this vision, more integration offers more opportunities for all. Second, with a negative connotation, integration is seen as synonymous with assimilation, conjuring up the image of an unwanted imposition of uniformity. This notion suggests that integration means to give up one’s own identity, and to totally immerse in the mainstream of societal conditions at a given place. Third, without any moral connotation, integration is perceived as a way to describe the established patterns of human relations in a society.

Accordingly, the term’s antonyms, i.e., social segregation and exclusion, may be conceptualised as the insufficiency of (a) the political and legal systems to guarantee civic integration, (b) the labour market to promote economic opportunities for all, (c) the welfare system to ensure public health for all, and (d) the family and community system to stimulate interpersonal relations and social capital (Berger-Schmitt 2000). Consequently, social integration attempts to counteract with regard to these deficits.

However, after the World Summit for Social Development in 1995, the concept of social integration widely fell out of use (Ferguson 2008) due to the dominance of its negative association, i.e., assimilation. Instead, it has become common to use the term “inclusion” referring to the first notion described above. Nowadays,

this term is commonly used in international and national documents oriented towards sustainability, e.g., the 2030 Agenda for Sustainable Development (United Nations 2015) and the New Urban Agenda (United Nations 2017).

In this article, social integration is understood in a comprehensive way. Emphasis is given to the first of the above listed notions within a wider framework of different trends of urban development. It is seen as an approach oriented towards inclusion in order to make societies more equitable.¹

On this background, the objectives of this article are to explore how the “socially integrative city” is understood in Europe and China, to analyse whether and to what extent this supports a common understanding of the term, and to elaborate a proposal for a joint concept. The results are based on a broad analysis of international literature and practice examples, especially from Europe and China. They were intensively discussed within an expert group with representatives from renowned European and Chinese institutions.² Among them were several European and Chinese top universities and research institutes dealing with urban issues. Moreover, experts came from related Chinese academies, such as the China Academy of Urban Planning and Design (CAUPD), China’s national institution that oversees all urban development in the country, the Chinese Academy of Sciences (CAS), and the Chinese Academy of Science and Technology for Development (CASTED). Finally, results were also discussed with representatives from the network of major European cities (EUROCITIES) and the China Center for Urban Development (CCUD) which is directly answering to China’s top macroeconomic planning institution, the National Development and Reform Commission (NDRC).

The article is structured in five parts. After this introduction, the concept of social integration and approaches promoting the inclusive city in Europe are discussed in the second chapter. This is followed by an analysis of the role of social integration in China’s urbanisation process. On the background of the analyses presented in Sections 2 and 3, a common European–Chinese approach towards understanding and defining characteristics of a socially integrative city is developed. Concluding, consequences of the concept’s implementation and its challenges are discussed.

¹ The authors acknowledge the existence of a conceptual difference between integration (something is wrong that must be fixed in order to fit) and inclusion (all children are different and can learn) in the area of social education.

² All related institutions and experts were members of the TRANS-URBAN-EU-CHINA project, funded by the European Union and supported by the Government of the People’s Republic of China.

2. Conceptualizing the Socially Integrative City in Europe

2.1. *The Call of International Organisations for Inclusive Cities*

For many decades, the international community has acknowledged the need to ensure that people can reap the benefits of urbanisation worldwide. Already, the Vancouver Declaration on Human Settlements, agreed upon during the United Nations Conference on Human Settlements (Habitat I) in 1976, advocated “the improvement of the quality of life ... of all people”, especially the most disadvantaged ones, and a more equitable distribution of development benefits (United Nations 1976, p. 4). Inclusive cities were seen as cities “in which all citizens are incorporated in decisions and policies; none in particular, the poorest and most vulnerable, are left out. All may both consider themselves and, be considered by others, to be full and first class citizens” (Stren 2001, p. 6).

In the UN-Habitat’s Global Campaign on Urban Governance in 2001, the United Nations promoted a vision of the inclusive city as a place where all can participate and benefit from the opportunities that urban areas offer. “An Inclusive City promotes growth with equity. It is a place where everyone, regardless of their economic means, gender, race, ethnicity or religion, is enabled and empowered to fully participate in the social, economic and political opportunities that cities have to offer” (UN-Habitat 2001).

At the heart of the campaign, there were three principles: respect for human rights, good urban governance, and equitable growth. In accordance with the program, urban social inclusiveness is advantageous for economic growth and central for sustainable development. It reduces inequalities and social tension, it incorporates the knowledge, productivity, and the social and physical capital of the poor and disadvantaged in city development, and it increases local ownership of development processes and programs (UN-Habitat 2001).

Accordingly, six areas were identified where local governments can have an impact on promoting social inclusion and economic growth (UN-Habitat 2001):

- Access to land and land planning regulations;
- Access to infrastructure and basic services;
- Local economic success which determines the resources available for improving access to land, infrastructure, and services;
- Promotion of labour-intensive work methods and support for small-scale industries and the informal sector;
- Access of the poor to justice and the enforcement of laws affecting the vulnerable population;

- Promotion of the ability of the urban poor to influence local decision making which determines local strategic planning, priority setting, and capital investment.

During the 2016 Habitat III Conference in Quito, UN-Habitat recognised that, unfortunately, inequality and exclusion persist in urban areas, and that two types of drivers are needed to combat urban exclusion and put cities on a better path: “The first is political commitment to inclusive urban development at multiple levels, in the face of many forces and stakeholders incentivizing uneven and unequal development. The second is a range of mechanisms and institutions to facilitate inclusion, including participatory policy making, accountability, universal access to services, spatial planning and a strong recognition of the complementary roles of national and local governments in achieving inclusive growth” (UN-Habitat 2015, p. 1).

Similar to the United Nations, the World Bank’s twin goals, i.e., ending extreme poverty and promoting shared prosperity, place the topic of inclusion in front, as “no country has transited beyond middle-income status while maintaining high level of inequality” (World Bank, p. 23). The concept of inclusive cities proposed by this organisation involves a complex web of multiple spatial, social, and economic factors. The spatial dimension deals with geographic segregation, the social dimension with discrimination,³ and the economic one with the lack of access to opportunities. It is acknowledged that these three dimensions of inclusiveness are intertwined. According to lessons learnt from different policies and programs, acting on one dimension while ignoring another is not advisable. Thus, the World Bank approach argues for an integrated multi-dimensional perspective where different interventions aim at inclusion in each dimension.

Concrete urban actions for promoting inclusion embrace the recognition of collective and individual rights, e.g., to the city, to housing, and to sanitation, ensuring participation in decision making, and enhancing safety and security. Concerning the operationalisation, the World Bank proposes three actions (Shah et al. 2015): (a) supporting, prioritising, and scaling up investment for inclusive cities, (b) looking for potential entry points for investments aimed at inclusion, and (c) building partnerships, i.e., between urban and rural areas, and between international organisations.

Similar to the World Bank, the Asian Development Bank (ADB) proposes an “Integrated Approach to Inclusive Urban Development”: “An inclusive city creates

³ Discrimination can take place on the basis of socio-economic status, gender, age, caste, and/or ethnicity, facing difficulties in gaining and securing access, rights, and opportunities in urban areas. For instance, in China, rural immigrants settling in cities may be denied the ability to access public services, while also sharing many of the necessities as the urban poor such as lack of housing and economic opportunities, poor living conditions, and social marginalization (Shah et al. 2015).

a safe, liable environment with affordable and equitable access to urban services, social services, and livelihood opportunities for all the city residents and other city users to promote optimal development of its human capital and ensure the respect of human dignity and equality” (Asian Development Bank 2017, p. 4). It encompasses sustainable, resilient, accessible, and affordable solutions by enhancing access to services and infrastructure through targeted investments.

From the perspective of the Bank, sustainability is seen as the capacity of an entity, e.g., a city, to operate, maintain, renew, and/or expand its housing and service delivery system and pro-poor infrastructure in the long run. Resilience is understood as the awareness of institutions regarding the context in which investments are made. For example, the affordability of a provided solution, the vulnerability due to climate change, and the planning and project development mechanisms may play a role here. Accessibility is understood in the sense of opening up opportunities for safe, secure housing and reliable basic services for all individuals and communities. Finally, affordability includes the possibility of families to benefit from offered services and of local and national governments to benefit from and have the capacity to support the systematic delivery of shelter, services, and transport to communities (Asian Development Bank 2017, pp. 4–5).

2.2. *Promotion of Social Integration and Cohesion in Europe*

Similar to the international discussion, the social dimension of integration, especially in urban areas, is an old topic in Europe (Threlfall 2003). Already, Article 2 of the Treaty establishing the European Economic Community in 1957 stated that it shall be “the aim ... to promote throughout the Community a harmonious development of economic activities, a continuous and balanced expansion, an increased stability”, and “an accelerated raising of the standard of living”.⁴ According to Article 3 of the Consolidated Version of the Treaty on European Union, the Union shall “work for the sustainable development of Europe”, “combat social exclusion and discrimination”, and “promote economic, social and territorial cohesion”.⁵

The European cohesion policy further specifies and implements these stipulations through a number of funds promoting an increased balance between regions and fostering social integration and inclusion at the local level. Since the Single European Act in 1986, it has become one of the important elements of the overall

⁴ Treaty establishing the European Economic Community (Rome, 25 March 1957). Available online: https://www.cvce.eu/obj/treaty_establishing_the_european_economic_community_rome_25_march_1957-en-cca6ba28-0bf3-4ce6-8a76-6b0b3252696e.html (accessed on 7 August 2020).

⁵ Consolidated Version of the Treaty on European Union. Official Journal of the European Union. C 326/13. 26.10.2012. Available online: https://eur-lex.europa.eu/resource.html?uri=cellar:2bf140bf-a3f8-4ab2-b506-fd71826e6da6.0023.02/DOC_1&format=PDF (accessed on 7 August 2020).

European policies architecture. Similar to preceding periods, the European Regional Development Fund (ERDF) fostered various integration and inclusion-oriented measures during the 2014–2020 funding period.⁶ Among them were measures to support the elaboration of community-led local development strategies, and the physical and socio-economic regeneration of deprived communities in urban and rural areas.

A milestone in European urban development support, especially regarding the socially integrative city, was the creation of the first URBAN Community Initiative Programme in 1994, after conducting 33 pilot projects in several cities in the years before since 1989. It was based on the insight that many cities contained “blackspots with high rates of unemployment, crime, poverty and dereliction” facing “problems of economic and social integration”. The URBAN Community Initiative was geared towards assisting “urban areas in crisis, particularly in terms of its three main axes of spending: physical and environmental regeneration; social inclusion; entrepreneurship and employment” (CEC 2002, pp. 3–4). URBAN I supported physical and environmental regeneration, innovative ways of promoting entrepreneurship and employment, and measures to promote social inclusion in general and especially of young people (CEC 2002, p. 8).

URBAN I was followed by the even more comprehensive URBAN II Community Initiative during the years 2001 to 2006. It included the following priorities: (a) mixed-use and environmentally friendly brownfield redevelopment designed to create employment, integrate local communities, improve security, and generally improve social life, (b) the support for entrepreneurship and employment, (c) the integration of excluded persons and affordable access to public services, (d) the promotion of environmentally friendly and integrated public transportation systems, (e) waste minimisation and treatment, noise reduction, and more efficient energy use, and (f) developing the potential created by information society technologies in the economic, social, and environmental sectors. URBAN programs had “to demonstrate a commitment to organisation change, participatory governance, empowerment and capacity building transferable into mainstream practice” (CEC 2002, p. 9). The decision making regarding the selection of sites was decentralised to the member states following a quota set by the Commission and applying a transparent selection mode based on objective criteria (CEC 2002, p. 11). In fact, inner city areas as well as

⁶ European Regional Development Fund (ERDF). Available online: https://ec.europa.eu/regional_policy/en/policy/themes/social-inclusion/ (accessed on 7 August 2020). Draft thematic guidance fiche for desk officers thematic objective 9: Social inclusion version 2–27/01/2014. ERDF Regulation (1301/2013) on Social inclusion. Available online: https://ec.europa.eu/regional_policy/sources/docgener/informat/2014/guidance_social_inclusion.pdf (accessed on 7 August 2020).

peripheral and suburban areas of larger cities formed the vast majority of sites chosen, whereas small cities accounted for only about 10 per cent (CEC 2002, pp. 13–14).

In 2002, URBAN II led to the establishment of the URBACT programme upon an initiative by the French Ministry of Urban Policy in agreement with other member states. It was created with the intention “to develop transnational exchange of experience between actors, . . . and to capitalise on . . . projects, drawing lessons from the results, successes and weaknesses noted.” URBACT was and still is supposed to “contribute to improved relevance and effectiveness of actions tackling the concentration of economic and social problems in small, medium-sized and large European cities, each with their own specific characteristics” (European Commission 2002). Until 2020, three programs, i.e., URBACT I, II, and III, have been implemented in order to “promote sustainable integrated urban development and contribute to the delivery of the European 2020 strategy” (URBACT 2018).

In 2007, the Treaty of Lisbon (Union 2007) supported further progress in consolidating the social dimension of integration, including full employment and solidarity between generations (Article 3). The document recognises the right of workers to information and consultation as well as collective bargaining, fair working conditions, social security, and social assistance (Article 6).

In parallel, the Leipzig Charta (Council of Ministers Responsible for Spatial Planning and Urban 2007) stressed that European cities register significant and increasing differences in economic, social, and environmental opportunities between neighbourhoods and groups. Thus, it was proposed to make greater use of integrated urban development policy approaches and to focus on deprived neighbourhoods within the context of the city as a whole (Table 1).⁷ The ample discussion process in preparing an update of the Leipzig Agenda in the second half of 2020, during the German EU Presidency, addressed a number of new challenges for European cities and their sustainable development. For example, new issues which dominated the urban development debate until recently and were prominent in the Europe-wide dialogue in preparation of the New Leipzig Charter include “‘Fridays for Future’ demonstrations, heatwaves, dealing with refugees, inner-city driving bans, exploding rents and land prices”, but also the rise of populism (Council of Ministers Responsible for Spatial Planning and Urban 2007). More recently, the COVID-19 issue “has shed even more light on key urban issues—for example urban density, and city resilience” (URBACT 2020a). The New Leipzig Agenda will promote just, green, and productive city strategies.

⁷ Areas suffering from an interlocking mix of social, economic, and environmental structural problems, exacerbated by a low community and institutional capacity that discourages investment and encourages exclusion.

Table 1. Recommendations of the Leipzig Charter on Sustainable European Cities, 2007.

<p>I. Making greater use of integrated urban development policy approaches:</p> <ul style="list-style-type: none">• Creating and ensuring high-quality public spaces;• Modernizing infrastructure networks and improving energy efficiency;• Proactive innovation and educational policies. <p>II. Paying special attention to deprived neighbourhoods within the context of the city as a whole:</p> <ul style="list-style-type: none">• Pursuing strategies for upgrading the physical environment;• Strengthening the local economy and local labour market policy;• Proactive education and training policies for children and young people;• Promotion of efficient and affordable urban transport.

In another document marking a cornerstone of European policies and strategies, the Europe 2020 Strategy, cities are seen as key to achieving the goal of “smart, sustainable and inclusive growth” (European Commission 2010). Urban areas are considered motors for regional growth because they offer a multitude of opportunities for upward social mobility and stimulate empowerment and participation. Consequently, the current EU cohesion policy (2014–2020) puts the urban dimension in a prominent place as at least 50% of the ERDF is invested in urban areas.⁸ Additionally, in each member state, a minimum of 5% of the ERDF is oriented to integrated sustainable development.

Finally, the Urban Agenda and the European Green Deal put emphasis on sustainable urban development and its social dimension. The Urban Agenda for the EU (Pact of Amsterdam), agreed at the Informal Meeting of EU Ministers Responsible for Urban Matters in 2016 (EU Ministers Responsible for Urban Matters 2016), has identified 12 priority themes for urban development which are highly relevant for guaranteeing improved living conditions and a better quality of life. Many of them make reference to or are relevant for social inclusion and integration. With the European Green Deal, the “urban dimension of cohesion policy will be strengthened”, and enhanced initiatives “will provide assistance to cities to help them make best use of opportunities to develop sustainable urban development strategies” (European Commission 2019, p. 23). The European Green Deal also promotes the idea to establish “a Just Transition Mechanism, including a Just Transition Fund, to leave no one behind” (European Commission 2019, p. 16).

All in all, the description above demonstrates that social integration and inclusion have a long history in Europe, a continent which, due to the growth of cities and new developments in peri-urban areas, turned to become predominantly urban already early during the last century, with all its facets of social exclusion and segregation.

⁸ This instrument is behind projects all over Europe that receive funding from the European Regional Development Fund (ERDF), the European Social Fund (ESF), and the Cohesion Fund.

Moreover, the decay of many inner-urban areas contributed to put social integration and inclusion high on the agenda. Specific funding mechanisms and a myriad of model projects have allowed building up solid, long-standing experience regarding socially integrated urban development (URBACT 2020b).

2.3. The Socially Integrative City—A German Program to Combat Social and Spatial Marginalisation

There is one more prominent approach towards social integration in cities in Europe which is relevant in the context of developing a common understanding of socially integrative cities. In Germany, the debate about socially integrative cities started already in the late 1970s. Social integration was starting to be seen as a way to cope with profound structural economic changes associated with a drastic reduction in employment, primarily in industry, affecting citizens, governments, and especially urban areas. Nevertheless, it took until the late 1990s for concrete measures to efficiently counteract decay in urban areas to be shaped. In 1999, the joint federal-state program “Districts with Special Development Needs—The Socially Integrative City” (SIC) was launched (Table 2). “Socially Integrative City” was the English translation of the German term “Soziale Stadt”. In more recent publications, it has also been translated as “Social City” (BBSR 2017; FES 2016).

Table 2. Socially integrative city: objectives and principles, based on the Organization for Economic Co-Operation and Development (2003).

- | |
|--|
| <ul style="list-style-type: none">● Social and ethnic integration, improving neighbourly community life;● Employment and education for local residents, placement on the primary labour market;● Economic revitalisation, support for local economy;● Redevelopment and modernisation measures, improving the residential environment; linking investment measures in urban renewal with non-investment social and employment measures;● Improving social and cultural infrastructure, integrating facilities such as schools, youth, and senior citizen facilities into district work, the promotion of children, young people, and families;● Improving (residential) security in the neighbourhood;● Public relations, image development. |
|--|

In early 2000, all 16 German regions at the state level (Länder) selected an urban area as a model district and commissioned a group of experts to conduct research. Selection took place in consultation with the respective municipality and the respective land. The program called for area-related integrated solutions, and for a change in attitudes of municipal and federal authorities, as well as of the behavior of other stakeholders, including businesses and citizens, in order to combat adverse social conditions at the local level. According to Löhner, SIC is the recognition that “urban development is more than building streets and squares. It concerns the people

who live there and their specific situation” (Löhr 2003, p. 3). An integrated action plan was drafted and developed jointly by local government, residents, business, and other actors (Table 3).

Consequently, the program is rather comprehensive. The program consists of five dimensions: (a) improving living conditions by upgrading the built environment, (b) improving the living conditions by better facilities in the social infrastructure, (c) improving the conditions for individual socialisation with the help of positive role models and social learning, (d) improving the image of a neighbourhood to avoid stigmatisation and discrimination, and (e) strengthening the role of a neighbourhood by improving local governance structures (BBSR 2017, p. 17).

Table 3. Socially integrative city: local stakeholders, based on Organization for Economic Co-Operation and Development (2003).

- Individual residents and existing resident grouping;
- Citizens action groups;
- Interest groups;
- Cultural, religious, and other associations (especially sports clubs) and networks;
- Urban renewal advisory board, tenant advisory committees and associations, youth committees;
- Crime prevention committees, city marketing bodies;
- Sponsors and sponsoring organisations active in the district, churches, and schools;
- Local business people, local retailers’ associations representatives of the housing industry;
- Representatives of political parties in city and district councils.

The SIC program includes federal financial aid to urban areas assuming their responsibility for self-renewal. In order to draw financial support, ARGEBAU, the workshop of the ministers and senators responsible for urban planning and construction of the different Länder, play an important role. An interregional mediation, information, and advice agency, the German Institute of Urban Affairs (Difu), was given the task to boost implementation in involved municipalities and to accompany the whole implementation process of the program. Until 2018, about 1000 measures received funding in more than 500 cities and towns in Germany (Bundesministerium des Innern 2019).

All in all, the SIC program has been evaluated positively in all of its five dimensions. As the evaluators write, the program has made an important contribution in disadvantaged neighbourhoods “when it comes to creating prerequisites for community building and to stimulate actors” (BBSR 2017). Building activities, integrated development concepts, neighbourhood management, and the availability of respective funds were important for its success. Nevertheless, the evaluation also demonstrated that achievements do neither come for free nor automatically. Complex programs, such as the SIC, need sufficient time and intensive care to succeed.

3. Social Integration in China's Urbanisation Process

3.1. New Directions in China's Urbanisation Policy

In China, the starting points regarding a special attention to urban development and social integration in cities differ from the ones in Europe. Although the country has an ancient tradition of city building and, at some points in its history, has been home to the world's largest and wealthiest cities, modern urbanisation is a rather young phenomenon. It takes place with very high speed and dynamics. In the past decades, Chinese cities have grown in an unprecedented way. Rapid urbanisation has been closely linked with fast economic growth and the relaxation of rural–urban migration regulations in order to meet employment demands in major cities (Müller et al. 2019).

While the urbanisation level was less than 20% in 1978, the urban population exceeded the 50% threshold only after 2010 (Figure 1), and it is expected to reach around 70% by 2030 and more than 75% in 2050 (United Nations 2018). The year 2011 marked a major milestone in Chinese history, like a symbol for the fact that the country entered a new stage of development. Achieving urbanisation on such a scale and in a comparatively short period of time has never been experienced before worldwide.

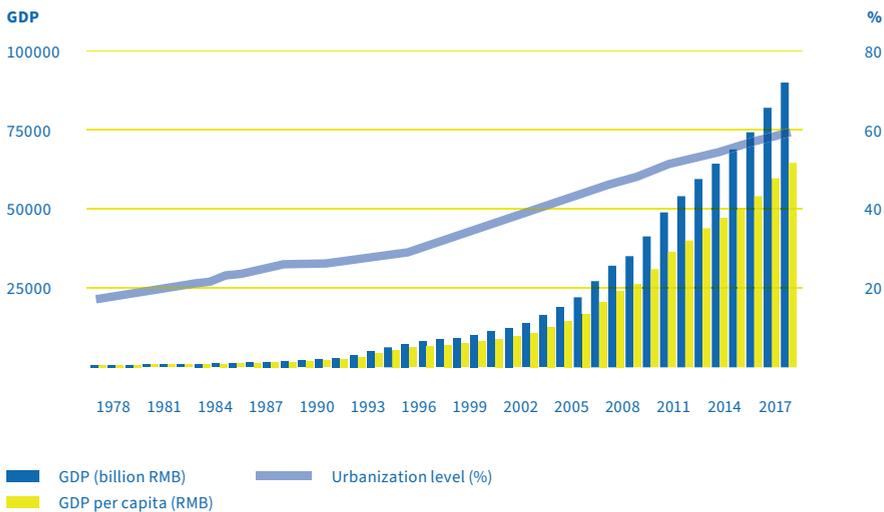


Figure 1. Growth of China's GDP and urbanisation level from 1978 to 2018, according to China National Bureau of Statistics. Source: Data from Müller et al. (2019), used with permission.

On the occasion of the Central Urbanisation Work Conference (CUWC),⁹ held in Beijing in 2013, Chinese leaders emphasised their commitment to urbanisation, calling it “the road China must take in its modernisation drive” (Tiezzi 2013). At the same time, they stressed that urbanisation and related policies would have to be “people-centred” (*yi ren wei ben*).

Emphasizing the human dimension of urbanisation was a reaction to widespread former approaches, which had been oriented towards economic growth driven by the GDP mania and land development driven by getting more off-budget resources with little consideration regarding limits of urban population growth. The policy shift was an attempt of the Chinese government to avoid negative consequences of uncontrolled urban expansion or sprawl that could affect and slow down urban development, such as a real-estate bubble, increasing local government debts, and economic imbalances between urban and rural regions (Tiezzi 2013).

Only one year later, in 2014, China’s National Development and Reform Commission, together with 12 major government ministries, put forward the National New-type Urbanisation Plan (2014–2020). The plan addressed the following “contradictions and problems” that were seen to require solutions (Griffiths and Schiavone 2016, p. 8).

- Approximately 234 million rural migrant workers and their families had difficulties in getting urban residence. As a consequence, they were residents without legal access to some essential urban rights (Wang et al. 2015), such as equitable education, public employment, preferential health care, locally specified pensions, and bank loans for purchasing socially affordable housing.
- The rate of urban land was growing faster than the urban population. From 2000 to 2011, the urban area increased by 76.4%, far exceeding the 50.5% growth rate of the urban population. Even the strict basic farming land protection policy did not avoid the fast growth of urban built-up land (Chen and Lu 2015). Additionally, land use and construction patterns were extensive and inefficient, leading to urban areas failing to reach the required population density. “Ghost cities/communities” were growing here and there, as a result of excessive housing supply and infrastructure outpacing the actual needs, along with business speculation on property demand (Chen and Lu 2015).
- The spatial distribution and the structure of the urbanised area were perceived as irrational. People moved to eastern areas while resources in the middle and western regions were not properly utilised. Moreover, in small and medium-

⁹ The CUWC is the platform where the Chinese Central Government lays out its guiding plan for the development of cities. The 2013 assembly was the first since the reform and opening-up policy initiated in 1978.

sized cities, the agglomeration of industry and the concentration of people had not been fully exploited.

- Urban management operations were inefficient, producing what was called “urban diseases”, such as traffic congestion as well as air, water, and soil pollution. Local governments were seen to focus on economic growth, infrastructure construction, and residential building while neglecting environmental concerns and improvement.
- Natural and cultural heritages were not adequately protected, and urban and rural areas were losing their specific identities. Natural environments had been destroyed or irrationally modified due to the creation of new development zones (Chen and Lu 2015).
- Institutional mechanisms, including household registration, land use management, and social security, as well as fiscal, financial, and administrative systems, seen as deficient, perpetuating urban–rural imbalances, restricting migration, and hindering the integrated development of rural and urban areas.

Although the New-Type Urbanisation Plan marked the beginning of a new era of urbanisation and urban development in China, little attention was paid to implementation, as a new start. On the one hand, it was not possible to turn around the steering wheel of urban development overnight given the huge inertia in path dependency, especially due to the strong shared authority by provincial and local levels (Kroeber 2016). On the other hand, it became increasingly clear that steps towards the so-called “*shiminhua*” (citizenisation) of peasants, the alteration of urban-biased policies, and increased participation will take a rather long time (Chen et al. 2016).

Against this backdrop, social integration, understood as the process where disadvantaged or vulnerable groups, for example, rural migrants or economically fragile persons, are incorporated into mainstream society (Berry 2011; Penninx and Garcés-Mascareñas 2016), becomes a crucial element in the Chinese transition towards more sustainable urban areas.

3.2. *Challenges for Social Integration in China’s Cities*

People-centred urbanisation and social integration in urban areas have become prominent topics in China. Moreover, there are several existing traditional provisions focusing on social life in neighbourhoods, such as those implemented through party-based civic organisations. Nevertheless, there are a number of challenges which especially need to be addressed.

Like in most cities worldwide, urbanisation has led and is leading to socio-economic segregation and a spatial differentiation between areas where poorer parts of the population live and areas with a certain concentration of more affluent

people. In the past, economic growth provided many opportunities for urban citizens to climb up the socio-economic ladder and to considerably improve their socio-economic and living conditions. Therefore, social integration in this sense, e.g., with regard to levelling or balancing differences, may have found hitherto only limited attention. When and whether this may change are difficult to predict.

However, urbanisation is also taking place in China throughout two interrelated people and place phenomena: the influx of rural migrants and the in situ urbanisation related with the reclassification of rural to urban land (Chen et al. 2017). Problems associated with the social integration of rural migrants in cities and urban villages¹⁰ have been discussed intensively in the literature (Li 2006; Wang and Fan 2012; Yue et al. 2016; Tian et al. 2019). They have to be taken into consideration in developing a common understanding of social integration. They can be summarised as described in the following subsections.

3.2.1. Institutional Restrictions

Since the 1950s, urban and rural citizens in China are clearly separated through a residential permit and registration system. In 1958, the Chinese household registration system, “*hukou*”, was introduced. It divided the population into agricultural and non-agricultural. According to the system, all citizens were obliged to register in one and only one place of permanent residence, which prevented free rural-to-urban migration and controlled labour transfer between cities (Chan 1994). The *hukou* system differentiates strictly between urban citizens, urban residents, and rural residents, with purposes of resource distribution, migration control, and the monitoring of targeted groups of people (Cheng and Selden 1994). Designation depends on where an individual’s parents or grandparents were registered, and it is not connected with the actual places of residence or even the place of birth (Boffy-Ramirez and Moon 2017).

Generally, rural residents can become urban citizens either through active im-migration, e.g., studying at vocational schools or colleges or marriage with urban residents, or through being granted an urban registration during urban extension processes (Wang et al. 2015). However, an urban *hukou* is difficult to acquire and is commonly understood as a barrier to upward economic mobility. The system provokes widespread criticism as not being “people-oriented” and as enlarging the urban–rural dichotomy (Wang et al. 2015; Griffiths and Schiavone 2016).

Since the release of the 12th Five Year Plan in 2011, a *hukou* reform was taking place in a number of cities as a possible tool to promote labour mobility and create a

¹⁰ An urban village is defined as a transitional neighbourhood characterised by tenuous land rights and a mixture of rural and urban populations. Once the agricultural land is expropriated, rural residents are entitled to the same benefits as urban citizens; however, the assignation of permits is far behind land conversion (Chen et al. 2017).

more stable urban society. Recently, in 2019, in line with the government efforts to alleviate overcrowded cities, the National Development and Reform Commission announced plans to cancel the *hukou* policy for cities with populations of up to 3 million inhabitants (Shumei and Keyue 2019). Gradually, most administrative obstacles to migrants settling in towns as well as small and medium-sized cities have been removed. However, provincial capitals and other large cities have maintained selective barriers to migrants' formal settlement. Additionally, the policy orientation remained talent-centred, benefiting only a small group of well-qualified migrants (Wang 2020).

Thus, the traditional institutional barriers are geared towards promoting segregation among the population in urban areas, i.e., between those who are full citizens and the rural migrants who may live in the same neighbourhood or district. This makes social integration in neighbourhoods, districts, and cities as a whole rather complicated and complex. In this case, social integration means to bring residents, who have differing rights and unequal access to urban infrastructure and services, together with fair basic rights.

3.2.2. Economic and Service Marginalisation

For decades, and as a result of subsidies oriented to promote rapid urban industrialisation, sharp differences exist between the living standards of urban and rural residents. Individuals holding urban *hukous* are entitled to work in state-owned enterprises, civil administration, public services, and business (Boffy-Ramirez and Moon 2017). Additionally, they have access to pension benefits, subsidised housing, and medical insurance, while low-income rural migrants have little or no access to such services (Griffiths and Schiavone 2016). Even more, a child without an urban status may not be able to enrol in local public schools (Boffy-Ramirez and Moon 2017). These conditions are disproportionate to migrants' impressive contribution to urban economic development.

Moreover, there are sharp per capita annual income disparities. As an average, they were 2.4 times higher in urban than in rural areas (Yusuf and Saich 2008). Additionally, the vastly greater job opportunities in cities make it highly attractive for rural people to migrate to urban areas. To economically integrate in cities, migrants usually accept so-called "3 D jobs", i.e., jobs which are dirty, dangerous, and demanding (Meng 2012). Keung Wong et al. (2006) described rural migrant workers as young males holding jobs in factories and in the service industries, working long hours as restaurant employees, factory workers, construction workers, or housemaids during the slack agricultural season. Since the majority of rural migrants are less educated and do not have special skills (Boffy-Ramirez and Moon 2017), job mobility among migrant workers is very low and limited.

The marginalisation of rural to urban migrants in cities poses enormous difficulties to social integration. Unlike in the case of European cities where international migration may be seen as an asset for neighbourhoods and districts to become more culturally diverse and more specialised, e.g., by offering a variety of specific services as well as diverse cultural environments, rural migrants in China do not offer as many opportunities for neighbourhoods and districts to become distinctive if this is at all wanted and accepted.

3.2.3. Narrow Social Networks, Isolation, and Discrimination

As a result of decades of continuous rural migration to urban areas, social integration of migrants has become an important challenge for local governments. In general, migrants consider urban areas as places to work and not to live. To save their earnings, they prefer to live in affordable small places, e.g., in urban villages, places that have transformed into functional but unregulated migrant enclaves (Li and Wu 2014). Urban villages' residents often rent their property as a source of income, "thus providing additional housing options for migrants but not creating stable or sustainable communities" (Chen et al. 2017, p. 3).

Besides working inequalities and welfare limitations, rural migrants face social isolation and discrimination (Wang et al. 2017). On the one hand, migrants' networks are networks of migrants that over time hinder their further integration (Yue et al. 2016). On the other hand, urban citizens and the media perceive migrants negatively, condemning them for overloading infrastructure, crime, and the violation of birth control regulations (Wissink et al. 2013).

Under these circumstances, social integration becomes a demanding task. It has to incorporate strategies to change the very different mindsets on both sides, with the urban citizens and the media, on the one hand, and the migrants, on the other hand. This requires persuasion, moderation, and mediation at all levels as well as, probably, a large general educational campaign at the national level oriented towards bridging differences between urban citizens and the rural population.

3.2.4. Limited Civic Engagement

Civic engagement differs significantly in China and the West. In China, civic engagement means involvement in activities of Urban Residents Committees (URC) and engaging in community participation confined to the development of urban neighbourhoods (Palmer et al. 2011). The URC form the lowest level of the administrative hierarchy, playing an important part in the political system. According to article 3 of the law on URC, their tasks include the dissemination of information about the Constitution, as well as the laws and regulations; handling public affairs and public welfare services of residents; mediating disputes; assisting residents in public health, family planning, social relief, juvenile education, etc.; and conveying

the residents' opinions and demands and making suggestions to the local people's government or its agencies.

This interest-driven participation system has important implications for understanding political participation in China (Guan and Cai 2015). City governments have made efforts to incorporate rural migrants into the activities organised by institutions such as the URC to improve their wellbeing and public acceptance. However, different studies show the lack of motivation of rural migrants to participate in any of their places of reference, neither in their own rural villages which they have left for work and which they visit only occasionally, nor in the urban communities where they work and live (Palmer et al. 2011; Wu et al. 2019).

Under these conditions and the related cultural imprint, it is unrealistic to expect a broader participation in urban matters other than neighbourhood-related ones, e.g., on strategic issues of overall city development, urban growth directions, new urban expansion and regeneration projects, or the protection of the environment in urban growth processes. City governments usually amply inform citizens about their plans and prospects, e.g., in their Urban Planning Exhibition Centres. However, they do not expect to critically discuss projects or to motivate residents to actively engage in urban issues. Moreover, in places where rural migrants live, it is even difficult to facilitate their social integration through the established institutional provisions.

4. A Shared European–Chinese Understanding of the Socially Integrative City¹¹

The above-described necessities and approaches in Europe and China regarding social integration and inclusion differ considerably. In Europe, social integration is highly focused on blackspots of urban decay, the inclusion of international migrants, the mediation between the haves and the have-nots as well as among the poorer parts of the population, and the mitigation of negative repercussions of socio-spatial segregation. In contrast, in China, strong and continuous economic growth has provided abundant opportunities for individuals to improve their socio-economic status and living conditions. Thus, on the one hand, barriers to climb up the socio-economic ladder have been by far less severe. On the other hand, rural migrants have largely contributed to China's economic success. However, they are neither integrated in the urban society nor do they enjoy the same rights and opportunities as urban citizens. In both cases, Europe and China, there is an urgent need to counteract. However, it is not surprising that policies, approaches, and strategies differ.

¹¹ This section is based on the contents of deliverable D6.6 of the EU-funded TRANS-URBAN-EU-CHINA project, i.e., the "Workshop Report on theoretical aspects of transition towards urban sustainability and the role of socially integrative cities", published online in March 2019 (Müller et al. 2019).

On this background, one may ask whether there is a basis for a shared understanding of the socially integrative city. In order to clarify this question, a European–Chinese expert group was formed. It consisted of 15 members of the TRANS-URBAN-EU-CHINA project consortium. Each of the 14 project partner institutions was represented. The authors of this article jointly presided over the group. The expert group analysed and discussed the preconditions and requirements of social integration in European and Chinese cities, and it developed a common understanding of the socially integrative city which is applicable in Europe and China. They expressed their opinion that a joint holistic and comprehensive concept of the socially integrative city should go beyond the challenges of internal and international migration. The shared normative foundation is described below.

A socially integrative city is understood as a socially mixed, cohesive, liveable, and vibrant urban area. Compactness, functional mix, and intra-urban connectivity as well as equal rights regarding the access to municipal services play an important role. Environmental quality, the quality of public spaces, and the quality of life contribute to the well-being of the population. Strengthening a sense of community and fostering a sense of place as well as preserving cultural heritage shape the city's inward- and outward-bound image. Investments into neighbourhood improvement, service delivery, infrastructure, and the quality of housing are important supportive measures. Empowerment and participation of the population, as well as social capital, are indispensable (Müller et al. 2019). Inclusiveness is an important feature; however, the joint understanding is wider and more comprehensive.

All in all, the socially integrative city has twelve characteristics grouped into five dimensions (Table 4): collaborative urban planning and design; urban environment and living conditions; local economy and labour market; socio-cultural development and social capital; and institutional development and urban finance.

Urban planning and design: Spatial planning and land management for promoting the socially integrative city hold particular potential in countries and cities where urbanisation is happening rapidly. Urban population growth offers the possibility of promoting new spatial forms, new approaches to the provision of services, and the creation of new opportunities for urbanizing populations. At the same time, the conversion and further development of older areas offer the possibility to carefully look at the existing structures and deficits, and to design counteractive measures in order to improve living and working conditions. Following the experiences in European countries, urban planning and design can be used to reduce urban sprawl and to promote a well-balanced land conversion from “rural” to “urban” and appropriate access to urban land. The (re-)design of existing neighbourhoods can be conducted in a way which makes public spaces attractive for citizens and enhances the qualities of the place. Such place making can also be applied in urban expansion areas. In order to achieve a sustainable growth, regeneration, and

redevelopment of cities, it is wise to involve all concerned stakeholders, including individual residents and users. Thus, collaborative and participative planning and design at the different politico-administrative levels are decisive instruments to guarantee consent, confidence, and well-being.

Table 4. Characteristics of the socially integrative city, based on Müller et al. (2019).

(a) Collaborative urban planning and design
1. Reducing urban sprawl and promoting well-balanced land conversion from “rural” to “urban” and appropriate access to urban land; 2. Involving the different stakeholders in collaborative and participative planning and design processes at the different politico-administrative levels.
(b) Urban environment and living conditions
3. Improving the environment and living conditions in urban areas for all; 4. Upgrading the physical environment in distressed areas; 5. Promoting efficient and affordable urban transport; 6. Assuring equal access to municipal services.
(c) Local economy and labour market
7. Strengthening the local economy and labour market; 8. Strengthening (technical and social) innovation in cities and neighbourhoods, opening up new possibilities for the local population.
(d) Socio-cultural development and social capital
9. Fostering proactive education and training policies for children and young people in disadvantaged neighbourhoods; 10. Preserving cultural heritage and fostering the identity of neighbourhoods and their inhabitants; 11. Fostering social capital and engagement of local stakeholders.
(e) Institutional development and urban finance
12. Supporting adequate institutional and financial conditions and mechanisms.

Urban environment and living conditions: Urban development programs in Europe and China have proven that interventions to upgrade the physical environment, especially in distressed areas, are an important element to support social integration in cities. Quality public spaces play a special role here. Interventions are supposed to improve the environment and living conditions in urban areas for all. In Europe, interventions in the physical structure of neighbourhoods usually happen in a rather careful way. Methods of “urban acupuncture” (Lerner 2014) and “urban dentistry” are applied in order to protect the urban ensemble while “curing” or renewing only a limited number of areas or buildings. Special attention is given to those areas and buildings which need interventions in order to generate a positive impact on the whole project area. House owners and renters are closely integrated as they are expected to share upgrading efforts on their own. In contrast, approaches in China have more frequently followed a more radical approach, i.e., to completely redevelop an area after relocating and compensating the population living there, while only eventually preserving buildings with historical value. Wherever such

developments take place, in inner-urban neighbourhoods or at the edge of cities, it is important to promote efficient and affordable urban transport in order to raise the attractiveness of an area and to promote environmental improvements by reducing emissions. Moreover, renewed and upgraded areas only become attractive and promote social integration if they guarantee equal access to municipal services.

Local economy and labour market: Examples in Europe and China demonstrate that neighbourhoods only become vibrant when there is a strong local economic base. In Europe, the employment situation and especially unemployment have regularly been addressed in programs. They have proved to be a key element for social integration in cities. Moreover, programs in Europe and China are often combined with efforts to strengthen the technical and social innovation capacities in cities and neighbourhoods in order to open up new possibilities for the local population. This can be done by attracting new companies to locate themselves in areas which are under transformation, but it can also be achieved through new forms of local services provision, the provision of local markets and small-scale shopping facilities, and local restaurants, as well as joint production models and the economic interchange among the population.

Socio-cultural development and social capital: Social capital is “the glue that holds societies together and without which there can be no economic growth or human well-being”, as Ismail Serageldin, the then World Bank Vice President, wrote in his foreword to Grootaert (Grootaert 1998). Although the term was used by a number of scholars since the early 1900s, it only became popular upon Robert Putnam’s seminal publications in the 1990s and especially in 2000 (Putnam 1995, 2020; Putnam et al. 1992). In the context of a neighbourhood or a city, social capital can be described as intense interpersonal relations, shared values and trust, and a shared sense of identity as well as preparedness to cooperate among the inhabitants. It is almost self-explanatory that social capital is a decisive prerequisite of the socially integrative city. Successful programs in Europe have demonstrated the key role of measures to raise the social capital in neighbourhoods, e.g., through respective neighbourhood or community management approaches. Thus, programs which address the socially integrative city should try to foster social capital and the engagement of stakeholders in an urban area. Moreover, other related socio-cultural issues play an important role. Therefore, the preservation of cultural heritage and other culture-related measures help to raise the sense of identity and belonging of residents. Finally, proactive education and training policies, especially for children and young people, help to raise perspectives of younger generations and a sense for valuing the place they belong to.

Institutional development and urban finance: Any support programs for promoting the socially integrative city are dependent on adequate institutional settings. These have to be open, supportive, and flexible if they shall bring about

success: open in the sense to be prepared to take up new ideas and developments; supportive in a way that they are regarded by the population as being useful and encouraging initiatives; and flexible in the sense that they are open for change as transformation processes, especially in distressed areas, are hardly predictable, and have higher uncertainties. Moreover, financial conditions and mechanisms should be appropriate to bring about achievements for the population. European experience has shown that projects are especially successful when different stakeholders join hands in their efforts to achieve social integration in neighbourhoods and cities, i.e., governments at the different levels, the private sector, and the population. Their shares have to be individually negotiated and decided.

The five described dimensions of socially integrative cities are closely interrelated. They are suitable as being both a concept for assessing cities and neighbourhoods with regard to the level of social integration they represent, and a conceptual tool for promoting socially integrative cities in Europe and in China.

5. Conclusions

There is a great variety of experiences in Europe and China with regard to social integration in cities and neighbourhoods. The analysis has shown that the preconditions as well as respective policies widely differ from each other.

- While Europe has been a predominantly urban continent for decades, the urban population in China reached the 50% milestone only one decade ago.
- While in Europe, the socially integrative city has been oriented towards multi-faceted challenges, such as urban decay, unemployment, poverty, and negative repercussions of international migration, China is facing a massive challenge regarding rural to urban migration.
- While in Europe, national governments and the European Commission have been engaged in urban issues and the creation of socially integrative cities with a broad range of programs and instruments since the second half of the 19th century, and especially the 1990s, China has embarked on its people-centred urban development strategy only since 2014 with its National New-type Urbanisation Plan.

Despite these differences, it has been possible to reach to a common understanding of the socially integrative city in Europe and China. A respective definition has been developed. Social integration is understood in a comprehensive way as an inclusionary goal, oriented to make urban societies more equitable. In order to support the spatial operationalisation of the concept, the related notion, elaborated by a group of experts from various universities of excellence, academies, and other influential research institutions in Europe and China, emphasises five dimensions of the socially integrative city with, all in all, 12 features. They encompass collaborative

urban planning and design, urban environment and living conditions, local economy and labour market, socio-cultural development and social capital, and institutional development and urban finance.

The term “socially integrative city” can be understood as an analytical concept as well as a guideline for shaping policies promoting socially integrative cities. It is apt to analyse social integration in cities and neighbourhoods, and to develop programs and measures for promoting it. Forerunner cities in Europe and China in terms of sustainable urbanisation can provide vast experience on how to best deal with the characteristics and challenges to build socially integrative cities in the future. This may be helpful for shaping the city of the future in Europe and for coping with urban challenges and directing urban development in China, where each year millions of people will continue to migrate from rural areas to cities.

The concept of the “socially integrative city” goes beyond the notion of the “inclusive city” as developed in the UN 2030 Agenda for Sustainable Development, especially in Goal No. 11, i.e., to make cities inclusive, safe, resilient, and sustainable, and the New Urban Agenda. The five dimensions and twelve characteristics of the concept have a global reach. They can be applied anywhere, and they have the potential to complement the respective targets of the Sustainable Development Goals.

Author Contributions: P.S. is the main author. She was responsible for research and the interpretation of data. She wrote the first draft of the article. B.M. was involved in elaborating the concept of the “socially integrative city”. He commented on the first draft and was involved in writing the final text. J.C. worked on the Chinese part of the article and contributed with details about the interpretation of the socially integrative city in China. He commented on the first draft of the article and contributed to the final text.

Funding: This research was funded by the European Union’s Horizon 2020 Research and Innovation Programme under Grant Agreement No. 770141.

Acknowledgments: The authors want to thank the members of the TRANS-URBAN-EU-CHINA expert group on developing a common European–Chinese understanding of the socially integrative city for their work and contributions. Moreover, they want to thank the editors of the book and the reviewers for their comments and suggestions.

Conflicts of Interest: The authors declare no conflict of interest. The founding sponsors had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

References

- Asian Development Bank. 2017. *Enabling Inclusive Cities. Tool Kit for Inclusive Urban Development*. The Philippines: Asian Development Bank.
- BBSR. 2017. *Zwischenevaluierung des Städtebauförderungsprogramms Soziale Stadt*. Bonn: BBSR.
- Bundesministerium des Innern. 2019. Soziale Stadt. BMI. Available online: https://www.staedtebaufoerderung.info/StBauF/DE/Programm/SozialeStadt/soziale_stadt_node.html (accessed on 7 August 2020).

- Berger-Schmitt, Regina. 2000. *Social Cohesion as an Aspect of the Quality of Societies: Concept and Measurement*. Mannheim: Centre for Survey Research and Methodology (ZUMA).
- Berry, John. 2011. Integration and Multiculturalism. *Papers on Social Representations* 20: 2.1–2.21.
- Boffy-Ramirez, Ernest, and Soojae Moon. 2017. *The Role of China's Household Registration System in the Urban-Rural Income Differential*. Bonn: IZA Institute of Labor Economics.
- CEC. 2002. The programming of the Structural Funds 2000–2006: An initial assessment of the Urban Initiative. In *14.6.2002COM(2002), 308 Final*. Brussels: Commission of the European Communities.
- Chan, Kam. 1994. *Cities with Invisible Walls: Reinterpreting Urbanisation in Post-1949 China*. Hong Kong: Oxford University Press.
- Chen, Juan, Deborah Davis, and Pierre Landry. 2017. *Beyond Hukou Reform: Enhancing Human-Centered Urbanisation in China*. Chicago: Paulson Institute.
- Chen, Mingxing, Weidong Liu, and Dadao Lu. 2016. Challenges and the way forward in China's new-type urbanisation. *Land Use Policy* 55: 334–39. [CrossRef]
- Chen, Zhao, and Ming Lu. 2015. Urban Systems and Urban development in the People's Republic of China. In *ADB Working Paper Series*. Tokyo: Asian Development Bank.
- Cheng, Tiejun, and Mark Selden. 1994. The Origins and Social Consequences of China's Hukou System. *The China Quarterly* 139: 644–68. [CrossRef]
- Council of Ministers Responsible for Spatial Planning and Urban, Development. 2007. *The Leipzig Charter on Sustainable Cities*. Leipzig: European Union.
- EU Ministers Responsible for Urban Matters. 2016. Establishing the Urban Agenda for the EU 'Pact of Amsterdam'. Available online: https://ec.europa.eu/regional_policy/sources/policy/themes/urban-development/agenda/pact-of-amsterdam.pdf (accessed on 27 April 2020).
- European Commission. 2010. Europe 2020 A strategy for smart, sustainable and inclusive growth. In *COM(2010) 2020*. Edited by Commission European. Brussels: European Union.
- European Commission. 2002. The Urbact Programme 2002–2006. In *URBAN II Community Initiative*. Brussels: European Union.
- European Commission. 2019. The European Green Deal. In *COM(2019) 640 Final*. Edited by Commission European. Brussels: European Union.
- Ferguson, Clare. 2008. *Promoting Social Integration*. Helsinki: United Nations Department of Economic and Social Affairs (UNDESA).
- FES. 2016. *The Social City Programme. Wise Urban Development for the Future of Our Cities*. Jakarta: Friedrich-Ebert-Stiftung.
- Griffiths, Martin, and Michael Schiavone. 2016. China's New Urbanisation Plan 2014–20. *China Report* 52: 73–91. [CrossRef]
- Grootaert, Christiaan. 1998. Social Capital: The Missing Link? In *Social Capital Initiative*. Washington: The World Bank.
- Guan, Bing, and Yongshun Cai. 2015. Interests and Political Participation in Urban China: The Case of Residents' Committee Elections. *The China Review* 15: 95–116.

- Häußermann, Hartmut, and Walter Siebel. 2001. Integration und Segregation –Überlegungen zu einer alten Debatte. *Deutsches Institut für Urbanistik* 1: 68–79.
- Jeannotte, Sharon. 2008. Promoting Social Integration. Paper presented at A Brief Examination of Concepts and Issues Helsinki: United Nations Department of Economic and Social Affairs (UNDESA) for the Expert Group Meeting on Promoting Social Integration, Helsinki, Finland, July 8–10.
- Kroeber, Arthur R. 2016. *China's Economy: What Everyone Needs to Know*. New York: Oxford.
- Lerner, Jaime. 2014. *Urban Acupuncture. Celebrating Pinpricks of Change that Enrich City Life*. Island: Press/Center for Resource Economics.
- Li, Bingqin. 2006. Floating population or urban citizens? Status, social provision and circumstances of rural–urbanmigrants in China. *Social Policy and Administration* 40: 174–95. [CrossRef]
- Li, Zhigang, and Fulong Wu. 2014. Migrant integration in China's urban villages: A case study of Beijing, Shanghai and Guangzhou. In *Rural Migrants in Urban China*. Edited by Fulong Wu, Fangzhu Zhang and Chris Webster. London: Routledge, pp. 100–21.
- Löhr, Rolf-Peter. 2003. Social Integrative City—the cooperation and confrontation between urban research and urban policy in Germany. Paper presented at EURA—Eurocities—MRI Conference "European Urban Development, Research and Policy—The Future of European Cohesion Policy, Budapest, Hungary, August 28–30.
- Meng, Xin. 2012. Labour market outcomes and reforms in China. *Journal of Economic Perspectives* 26: 75–102. [CrossRef]
- Müller, Bernhard, Paulina Schiappacasse, Jianming Cai, and Enpu Ma. 2019. D 6.6 Workshop Report on "Theoretical aspects of transition towards urban sustainability and the role of socially integrative cities". In *TRANS-URBAN-EU-CHINA. Transition towards sustainability through socially integrative cities in the EU and in China*. Edited by IÖR; Dresden: IÖR, Technische Universität Dresden, Chinese Academy of Sciences.
- Organization for Economic Co-Operation and Development. 2003. *Berlin: Towards an Integrated Strategy for Social Cohesion and Economic Development*. Edited by OECD. Paris: OECD.
- Palmer, Neal, Douglas Perkins, and Qingwen Xu. 2011. Social capital and community participation among migrant workers in China. *Journal of Community Psychology* 39: 89–105. [CrossRef]
- Penninx, Rinus, and Blanca Garcés-Mascareñas. 2016. The Concept of Integration as an Analytical Tool and as a Policy Concept. In *Integration Processes and Policies in Europe*. Edited by Blanga Garcés-Mascareñas and Rinus Penninx. Cham, Heidelberg, New York, Dordrecht, London: Springer, pp. 11–29.
- Putnam, Robert. 1995. Bowling Alone: America's Declining Social Capital. *Journal of Democracy* 6: 65–78. [CrossRef]
- Putnam, Robert. 2020. *Bowling Alone: The Collapse and Revival of American Community*. New York: Simon and Shuster.
- Putnam, Robert, Robert Leonardi, and Raffaella Nanetti. 1992. *Making Democracy Works*. Princeton: Princeton University Press.

- Shah, Phoram, Ellen Hamilton, Fernando Armendaris, and Heejoo Lee. 2015. *World Inclusive Cities Approach Paper*. Edited by World Bank. Washington: World Bank Group.
- Shumei, Leng, and Xu Keyue. 2019. China relaxes hukou restrictions to invigorate development. *Global Times*. Available online: <https://www.globaltimes.cn/content/1174818.shtml> (accessed on 27 April 2021).
- Stren, Richard. 2001. *Thinking about Urban Inclusiveness*. Washington: Woodrow Wilson Center, Toronto: The University of Toronto, Canada.
- Threlfall, Monica. 2003. European social integration: harmonization, convergence and single social areas. *Journal of European Social Policy* 13: 121–39. [CrossRef]
- Tian, Ming, Zheng Tian, and Wei Sun. 2019. The impacts of city-specific factors on social integration of Chinese migrant workers: A study using multilevel modeling. *Journal of Urban Affairs* 41: 324–37. [CrossRef]
- Tiezzi, Shannon. 2013. China's New Urbanisation Plan. *The Diplomat*. December 17. Available online: <https://thediplomat.com/2013/12/chinas-new-urbanization-plan/> (accessed on 27 April 2021).
- UN-Habitat. 2001. Inclusive Cities Initiative—The Way Forward. Cities that Practice and Champion Inclusive Urban Governance. Available online: http://mirror.unhabitat.org/downloads/docs/2115_1346_way_forward_29.May.doc (accessed on 27 April 2021).
- UN-Habitat. 2015. Inclusive Cities. Paper presented at Habitat III Conference on Housing and Sustainable Development, Quito, Ecuador, October 17–20.
- European Union. 2007. Treaty Of Lisbon. In 2007/C 306/01. Lisbon: European Union.
- United Nations. 1976. *The Vancouver Declaration On Human Settlements*. New York: United Nations.
- United Nations. 1994. Social Integration: Approaches and Issues. In *Briefing Paper No.1*. New York: United Nations Research Institute for Social Development.
- United Nations. 2015. *Transforming Our World: The 2030 Agenda for Sustainable Development*. New York: United Nations.
- United Nations. 2017. *The New Urban Agenda*. New York: United Nations.
- United Nations. 2018. *World Urbanisation Prospects: The 2018 Revision*. Edited by Population Division. New York: Department of Economic and Social Affairs.
- URBACT. 2018. Come search our wealth of Good Practices. Available online: <https://urbact.eu/good-practices/home> (accessed on 26 April 2021).
- URBACT. 2020a. Is Covid a game-changer for the New Leipzig Charter? Last Modified August 6, 2020. Available online: <https://urbact.eu/covid-game-changer-new-leipzig-charter> (accessed on 10 August 2020).
- URBACT. 2020b. Urbact at a Glance. Last Modified July 2020. Available online: <https://urbact.eu/urbact-glance> (accessed on 10 August 2020).
- Wang, Wenfei Winnie, and C. Cindy Fan. 2012. Migrant workers' integration in urban China: Experiences in employment, social adaptation, and self-identity. *Eurasian Geography and Economics* 53: 731–49. [CrossRef]

- Wang, Xiang. 2020. Permits, Points, and Permanent Household Registration: Recalibrating Hukou Policy under “Top-Level Design”. *Journal of Current Chinese Affairs* 30: 1–22. [CrossRef]
- Wang, Xin-Rui, Eddie Chi-Man Hui, Charles Chogill, and Sheng-Hua Jia. 2015. The new urbanisation policy in China: Which way forward? *Habitat International* 47: 279–84. [CrossRef]
- Wang, Zheng, Fangzhu Zhang, and Fulong Wu. 2017. Social Trust Between Rural Migrants and Urban Locals in China—Exploring the Effects of Residential Diversity and Neighbourhood Deprivation. *Population, Space and Place* 23: 15. [CrossRef]
- Wissink, Bart, Arjan Hazelzet, and Werner Breitung. 2013. Migrant integration in China: Evidence from Guangzhou. In *Rural Migrants in Urban China*. Edited by Fulong Wu, Fangzhu Zhang and Chris Webster. London: Routledge, pp. 99–120.
- Keung Wong, Daniel Fu, Chang Ying Li, and He Xue Song. 2006. Rural migrant workers in urban China: living a marginalised life. *International Journal of Social Welfare* 16: 32–40. [CrossRef]
- World Bank. *Annual Report 2013*. Edited by The World Bank. Washington: The World Bank.
- Wu, Rong, Zhigang Li, Ye Liu, Xu Huang, and Yuqi Liu. 2019. Neighbourhood governance in post-reform Urban China: Place attachment impact on civic engagement in Guangzhou. *Land Use Policy* 81: 472–82. [CrossRef]
- Yue, Zhongshan, Shuzhuo Li, Xiaoyi Jin, and Marcus W. Feldman. 2016. The role of social networks in the integration of Chinese rural–urban migrants: A migrant–resident tie perspective. *Urban Studies* 50: 1704–1723. [CrossRef]
- Yusuf, Shahid, and Tony Saich. 2008. China Urbanizes. Consequences, Strategies and Policies. In *Directions in Development. Countries and Regions*. Washington: The World Bank.

© 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Managing Urban Expansion in Europe: New Impulses for People-Centred Development in China?

Paulina Schiappacasse, Bernhard Müller, Jianming Cai and Enpu Ma

1. Introduction

Over the last four decades, China has experienced an unprecedented urbanisation process. The rapid growth in the urban population was paralleled by a massive expansion of urbanised land, promoted by policies oriented towards land development. However, with the emergence of “ghost cities” or, more precisely, “ghost neighbourhoods”, due to an oversupply of housing and the increasing loss of fertile land vital for food security in the country, the need for a policy shift became evident (Shepard 2015).¹ The National New-Type Urbanisation Plan (NUP, 2014–2020) marks the turnaround from a “land-centred” towards a “people-centred” approach to urbanisation, aimed at slowing down urban expansion in China and putting more emphasis on the human dimension of urbanisation, i.e., people’s needs and the improvement of quality of life.

Like China, Europe has a long history of urban development. However, in contrast to China, the number of the urban population in Europe exceeded the rural one in 1950. Over the years, the percentage of urban population slowly grew, e.g., to 70% in 1995, and 75% in 2020. It is expected to further moderately grow to almost 78% in 2030 and around 84% in 2050. Nevertheless, in Europe, urban expansion became a serious issue during the second half of the 20th century. Since the mid-1950s, urbanised areas expanded by 78%, whereas the population grew by only 33% (EEA 2006, p. 11). However, for at least three decades, many efforts have been made to manage urban expansion in a more sustainable way. They may provide useful references for conceptually enriching the “people-centred” urban development in China, although the frameworks and concerns about urban expansion are quite different in both parts of the world.

Against this background, the article looks at urban expansion in China and Europe. The authors understand urban expansion here as the process of extending

¹ The term “ghost cities” refers to the title of a book published in 2015. In fact, “ghost cities” or, more precisely, “ghost neighbourhoods”, in China are new and fully equipped, but under-occupied, urban developments that have yet to receive resident immigration. They have often evolved because of large urban investments by developers, which have not (yet) been able to attract sufficient numbers of residents (Shepard 2015).

the built-up area of a given city beyond its limits (urban extension) or by using idle land inside the urbanised structures (urban infill).² This may happen within the administrative boundaries of its own jurisdiction, or it may involve different local governments.

The article has the objectives of reviewing urban expansion processes in China and Europe, and looking at some European approaches oriented towards limiting urban expansion and promoting social integration. The experiences may be relevant and inspiring for shaping people-centred, i.e., socially integrative, urban expansion in China.

Methodologically, the article is based on a mixed-methods approach. The authors conducted analyses of the literature and documents as well as expert interviews, group discussions and site visits during several field trips in Europe and China. The literature regarding urban expansion and urban sprawl in Europe and China was reviewed in a comprehensive way. The analysis was based on an extensive keyword-oriented internet search, including scientific journals and practice reports. Moreover, relevant European and Chinese documents, especially from governments, cities and city associations, were reviewed. Preliminary results were discussed and validated with experts from Europe and China, e.g., with representatives of partner institutions of the TRANS-URBAN-EU-CHINA project,³ as well as with practitioners from different cities in urban living lab discussions over the course of the project implementation. Group discussions, e.g., on project workshops, conferences and online seminars, were conducted, and cities which provide good practice examples were visited.

The structure of the article is as follows: after the introduction, the second section deals with urban growth in China and its challenges. It looks at China's urbanisation since the economic reforms in 1978. It analyses its pace and spatial distribution, and differentiates the most common types of expansion. Moreover, it refers to the actual debate about new ways to promote people-centred urban development. The third section of this article deals with urban expansion in Europe. It depicts the processes of urban growth and planning policies to manage urban expansion in a more responsible way. The fourth section deals specifically with approaches to

² The authors acknowledge the different notions of a "city" and "municipality" in China and Europe from an administrative point of view. When using the term "city" in the Chinese context, they primarily refer to the "urban area" of the city, a term, which in Europe is used to cover cities, towns and suburbs. When using the term "municipality", they refer to the local administrative unit in the sense of the European Union.

³ TRANS-URBAN-EU-CHINA is a research and innovation project under Horizon 2020, involving 14 partner institutions of excellence from Europe and China, both from academia and practice. It has received funding from the European Union during the period between 2018 and 2020. For further information and for the detailed steps of the implementation of the project, which are relevant here, please refer to www.transurbaneuchina.eu (accessed on 2 September 2020).

control and limit urban expansion in Europe and to make urban expansion more socially integrative. Finally, conclusions concerning people-centred urbanisation in China are drawn.

2. Urban Expansion in China and the Search for New Growth Models

2.1. China's Urban Expansion Since the Economic Reform in 1978

The introduction of the socialist market economy and the open-door policy in 1978 marked the beginning of “a new era of development” in China (Li 2020). Since then, land and urban expansion have played a crucial role in the overall policy agenda of the country as instruments to achieve national development goals. According to statistical figures, urban built-up areas in China increased sevenfold between 1981 and 2015 (National Bureau of Statistics PRC 2016). Nevertheless, studies based on remote sensing present more conservative estimates. For example, according to Schneider and Mertes, the total urban land extent in Chinese cities more than tripled for all city sizes and locations between 1978 and 2010, and increased four to five times in coastal areas targeted by early modernisation policies (Schneider and Mertes 2014). Additionally, following the results of the World Bank, built-up urban land expanded by 35% during the first decade of the new millennium (World Bank 2015). Although figures may differ in detail, the general trend is the same. This is alarming because the increase in urban land in China was about 1.7 times higher than the urban population increase during the period between 2000 and 2017.⁴

There are many drivers behind this tendency. Since 1978, Chinese leaders have seen economic growth as a paramount priority, and, to a large part, land as its basis and financing policy instrument. However, there was a clear distinction between rural and urban land, as well as between rural and urban residents. The latter was related to the household registration system (*hukou*), introduced in 1958, which divided the population into agricultural (dominant in rural areas) and unon-agricultural (mainly in urban areas), and which became the basis of a sharp urban–rural dichotomy and separation. It was only after first *hukou* system reforms in the 1980s that rural residents were allowed to come to urban areas and to access off-farm employment (Li 2020). Nevertheless, to date, they do not enjoy full citizenship rights and do not have full access to the benefits of urban life.

From the beginning, it was evident that the modernisation of agriculture and industry, as well as the opening-up for foreign direct investment, depended on the availability of land and land-use regulations. Therefore, the government's strategy was twofold. As food security was a common social and political priority,

⁴ https://www.sohu.com/a/342695313_467568 (accessed on 2 September 2020).

China adopted restrictive laws on farmland protection. In parallel, the government introduced a number of reforms to mobilise urban land for speeding up local economic development, and for providing housing to accommodate the necessary workforce.

Modernisation success was primarily measured against growth rates of the gross domestic product (GDP). Van Heijster argues that GDP “appropriated a symbolic function”, as Chinese politicians used it as an icon within the political narrative of the country’s modernization, and as an “instrument of imagination”. They “conceptualised the political goal of achieving modernization in terms of GDP”(van Heijster 2020). For example, one of the national targets in the early 1980s was to quadruple the GDP of 1980 by the year 2000 (van Heijster 2020). Aiming to reach this target, China kicked off its GDP-centred economic rolling ball, and, in fact, it met its target almost five years in advance.

The post-1978 massive industrialisation of the country radically changed China’s development path, especially in urban areas. Fiscal decentralisation reforms in the country played an important role in this. With the introduction of fiscal contracting systems between 1978 and 1993, and a new tax sharing system between the national and local governments since 1994 (Shen et al. 2012), cities were able to gain access to direct income through land transfer and land banking appreciation. Revenues from land transfer and land banking were mainly left to local governments as their off-budget resources, which can be used in a less regulated way. Consequently, Chinese local administrations showed high enthusiasm to obtain more and more land through urban expansion and land conversion. Revenues from auctioning and granting long-term land leases to developers became an important pillar and source of urban financing.

The modernisation of the manufacturing industry substantially stimulated urban expansion. The relocation in State-Owned Enterprises (SOEs) from downtown to peri-urban areas consumed a lot of farmland in suburbia. Nevertheless, both SOEs and cities usually benefited greatly from the relocation, for three reasons. Firstly, the manufacturing facilities could be substantially enlarged. Secondly, the SOEs could considerably enhance their technology standards. Thirdly, the leftover land in the urban centre could be redeveloped at a much higher value, providing more job opportunities in the tertiary sector for family members of workers. On the other hand, the attractiveness of new investments in the manufacturing sector, both domestic and international, required more industrial land within the urban administrative boundary. To meet these needs and to avoid the limited land quota restrictions, various economic and high-tech development zones were formally or informally established throughout urban China. Almost every county, and even some small towns in eastern China, had their own development zones, as well as major cities. Consequently, vast farmland was occupied. This speeded up urban expansion in

China despite several rounds of adjustment policies implemented in the late 1990s and 2000s in order to mitigate, to a certain degree, the negative impact of urban expansion.

New emerging real estate markets, due to the changing demands of a more affluent population and the housing needs of rural migrant workers, further encouraged cities to expand. In the course of the land marketization reform, cities made land available to large-scale developers for residential use, i.e., new large housing estates, new towns, new urban centres, and modern commercial facilities at the urban fringes and in peri-urban areas. Nearly all cities in China chose land-led urbanisation as their key strategy for urban development.

Fiscal decentralisation was coupled with the national government's performance assessment system, which was introduced in the late 1980s in order to "ensure that local governments adhered to national political priorities". In line with its symbolic function, GDP became one of its important components (van Heijster 2020, p. 64). The system, which was also relevant for the promotion of leaders, proved to drive regional competition for better performance rankings within the national framework. Land became a cornerstone of cities' strategies to attract industrial investments, including those from abroad, and thus the GDP-based performance assessment system accelerated even irrational urban expansion (Yeh and Fu 1996; Yeh et al. 2015; Wu et al. 2006).

Parallel to the changes in the tax-sharing system, the Chinese central government introduced a number of further policy changes to stimulate and accelerate urban growth. Since the early 1990s, SOEs were beginning to be privatised, which led to the displacement of about 15 million workers between 1993 and 1998 (Cai 2002; Solinger 2001). In 1998, a system of leasing land on a long-term basis was established (Lin 2012) in order to incentivise the re-use of areas previously occupied by SOEs. On the one hand, this was supposed to support and accelerate the restructuring of SOEs, and, on the other hand, to improve the living conditions of their workers. As local governments could retain profits from this process, they were enthusiastic to support the policy change. The new land lease system triggered the massive redevelopment of inner urban areas in the sense that large portions of urban land were levelled and prepared for urban re-use.

Urban expansion has mainly taken place in eastern economic powerhouse regions, especially in the city clusters of Beijing–Tianjin–Hebei, the Yangtze River Delta and the Pearl River Delta, and, to a smaller extent, along the Taiwan Strait, while the rest of the country shows much slower urban expansion both in terms of size and pace. Moreover, in many places, especially third-tier cities (Wong 2019) and below, i.e., provincial capitals as well as prefecture and county-level cities, rapid urban sprawl, along with the speculation practices of developers, led to an excessive housing supply outpacing the demand.

In some parts of the country, “ghost cities” have emerged as a result of the “land-centred urbanisation”, giving rise to resource waste and societal unrest. The financial risks of the real estate sector have become an increasingly serious issue (Hui and Bao 2013). Moreover, in many regions, booming urban expansion resulted in urban development areas with low quality in terms of urban design and construction (Wei 2019). Besides emblematic and iconic buildings in certain cities, new housing areas often look rather uniform all over the country, and, in many cases, they lack local identity and a sense of place.

2.2. Forms of Urban Expansion in China

Urban expansion in China is bound to strict rules, and cities are not allowed to grow without limits. In general, any type of urban expansion requires the conversion of the type of land use, e.g., from rural to urban.⁵ The change in land-use functions is a basic procedure, which precedes any further concrete action and urban development project. The extent to which a city can convert land is determined through the farmland conversion quota system (Zhong et al. 2018).

The quota system was introduced in 1998. Its objective was to limit the loss of farmland due to fast urbanisation, and to safeguard the country’s food security. Moreover, the system aimed to encourage or push cities to use their developable urbanised land more efficiently and in a more intensive and compact manner. In fact, the Chinese government has declared that the related land-use planning is “fundamentally a planning system that upholds the strictest arable land protection and the most frugal land use” (Xiao and Zhao 2015, p. 10).

The land quota system works hierarchically in a top-down way, from the national level to the provincial and local levels. The quota, which is allocated to a city or a county town by the province, is determined based on economic performance and local needs, e.g., the extent of the locally available urbanised land and the population forecasts for the local entity.

A city or town has to follow the quota and specify it in its masterplan, e.g., in terms of location, time, and construction purpose. The scope of land-use change in the masterplan needs to be aligned with the land-use plan, which designates the land quota for urban development in a certain planning period. Initially, the land quota was neither transferable nor bankable between provinces (Xiao and Zhao 2015). However, this was relaxed to some extent during the last decade through the introduction of a new strategy oriented towards keeping the balance in the occupation

⁵ In China, there are two kinds of land according to landownership: state-owned land, which is usually urban land, and the land collectively owned by a rural community, which is normally located in rural and sub-urban areas (<https://www.chinajusticeobserver.com/a/chinas-legal-framework-on-land-administration>, accessed on 27 December 2020).

and replenishment of farmland in urban expansion. It required each province to make sure that the same amount and an equivalent quality of farmland which was lost due to urban expansion would have to be reclaimed, either in its own province or in other provinces, with the possibility of transferring the reclamation cost. Without the official change in land-use functions, any land use and development for urban purposes is considered illegal in China.

In cases where rapid economic development and the vast inflow of rural migrants require additional urban land exceeding the fixed land quota, the designation of new districts and development areas is rather difficult. "The system is inflexible, and thus ignores variance in land resources and land demand across locations and over time"(Xiao and Zhao 2015, p. 2). Nevertheless, it is not impossible to mobilise additional urban land in a fast-growing city. In this case, the city can apply to higher authorities to enlarge its urban area in order to designate a "new area". A "new area" or "new district" is a new urban administrative unit that receives special economic and development support by the national or regional governments. Besides initiatives from the top level, such as, for example, in the cases of Shenzhen, Pudong, Xiong'an and other national-level new districts and new economic zones, a city can propose the designation of a nearby (rural) county as a new urban district, or define an area at the urban fringe as a new urban area or a new economic development zone (Zhuang and Ye 2018). The application needs to be approved by the upper-level government and the people's congress at the same level, i.e., at the state, provincial, or prefectural level.

Experience shows that the designation and approval of a new urban district is usually more time-consuming than the formal establishment of a new economic development zone. While there may be convincing reasons to develop a new area for economic purposes, e.g., the new allocation of enterprises or special requests by industries, the designation of a new urban district for predominantly residential purposes is more comprehensive and requires changes in the administrative framework and scope.

Instead of extending urban areas to the rural hinterland, urban redevelopment and infill can be seen as an effective way to accommodate urban growth and the expansion of built-up areas. It is oriented towards changing or enhancing the functions of existing urban land and tapping the undeveloped land within or in-between built-up land. For example, it refers to cases where large old housing areas are substituted by modern, usually multi-storey urban development projects providing upscale housing and commercial facilities. The relocation of residents, including compensation, and large-scale demolition of old neighbourhoods are characteristic of this form of government action, oriented towards combatting poverty, minority concentration, social disorder and physical neighbourhood decline. However, according to Li, neighbourhood demolition and forced relocation have

been criticised from different perspectives, e.g., for causing various negative impacts on disadvantaged social groups and for dissolving the existing social fabric (Li 2018).

Another example of urban redevelopment is the relocation of large industrial installations and factories. In such instances, sites are usually levelled and new development takes place. In the past, urban redevelopment was very often linked with the relocation of SOEs. When spatial economic restructuring reform encouraged or obliged SOEs to reorganise and relocate their production facilities, e.g., from rather central urban areas to either economic development zones or industrial parks in farther peri-urban areas, the land was obtained and prepared for redevelopment.

In any urban redevelopment, the acquisition of additional new urban land is necessary in order to relocate residents and/or production facilities. Depending on the location of the old sites, e.g., in central urban areas, redevelopment can be a rather lucrative undertaking for local governments and developers.

Urban expansion has often led to the emergence of another phenomenon in Chinese cities, i.e., urban villages (Liu and He 2010). Once located at the urban fringes, villages have been integrated into the urban fabric without losing their status as a rural area. The phenomenon emerges when a city expands, and only the agricultural land, but not the settlement where villagers live, is converted into urban land, e.g., due to high compensation or relocation costs for villagers.

Thus, urban villages are distinct from other parts of a city, physically, socially and administratively (Gao et al. 2020). They form rather independent entities within cities, sometimes close to urban centres and other prime locations, and with good connectivity. In most cases, they are characterised by low-rise constructions, high population densities and poor living conditions. Because of lower real estate prices and rents, they are the preferred location for the transient population, such as rural immigrants, students, or young professionals and start-ups, sometimes causing disruptions to the existing social fabric (Li 2018).

The renovation of urban villages and related shantytowns may, in part, be similar to urban regeneration, e.g., if local governments find means of compensation and if an area is highly attractive for real estate developers. However, in many cases it is more similar to urban renewal activities, such as in situ upgrading the physical environment, providing employment, and strengthening the social fabric. The renovation will usually add more public space and facilities to urban villages and shantytowns. In most cases, it will lower density, and thus more land has to be converted on the urban fringe or in peri-urban areas to accommodate those who have to move out.

Finally, urban expansion also happens in the form of informal settlements. These usually appear at the urban fringe and in peri-urban areas of Chinese cities. These locations are usually rather attractive for accommodating rural immigrants. Moreover, new homes can be built under the collective landownership of a rural area.

However, they are neither formally legal nor part of a planning process by the local governments. Nevertheless, they exist, “consume” land, usually extend the urban areas progressively and accumulatively, and, as future shantytowns, they may turn into problematic areas within the framework of further urban extension. Moreover, informal settlements are more often exposed to environmental and natural hazards than other forms of urban expansion.

2.3. From Land-Centred to People-Centred Urbanisation

In recent decades, rapid urban expansion has led to a number of challenges for sustainable urban development. According to the NUP (2014–2020), this was based in land-led urbanisation which was driven by the property development interests of both local governments and large real estate developers. Urban land became the main off-budget source for city governments, and thus a financial source for urban infrastructure investment. Moreover, urban land was an important means of attracting foreign and local investment for cities, thus enhancing the performance of a city in the national rankings, and, consequently, providing an opportunity to receive a higher land quota for new urban expansion areas from the respective province.

Many rural migrant workers settled in cities or at their urban fringes. However, they had difficulties in obtaining official urban residence and access to urban services. Urban–rural imbalances deepened. Urbanised land grew much faster than the urban population. Ghost cities appeared up in many parts of the country, due to the fact that housing offers exceeded demand, and new apartments were not affordable for many households. Farmland protection was also not fully effective. Despite the careful application of the land quota system, the accelerated urban expansion caused the loss of a substantial portion of high-quality farmland. It even put the “red line” of protected and reserved farmland for China’s grain security under risk (World Bank, and DRC 2014).

Moreover, natural areas were destroyed. Patterns of urban expansion were impressive but rather uniform all over the country. Land use was less efficient than intended. Car-oriented urban development with wide roads and broad transportation corridors were established to cope with expected future traffic. However, all this also contributed to losing a “human dimension” in new urban developments, e.g., in terms of compactness, short distances and social cohesion. Almost identical high-rise buildings contributed to making urban development more anonymous, losing the character of the place. Urban population was mainly concentrated in large cities in the eastern parts of the country, while medium-sized and small cities, as well as central and western areas, were left behind in terms of industrial development and population growth. Traffic congestion and environmental problems evolved in many cities and neighbourhoods. Cultural and natural heritage was in danger. Management was seen to be deficient in many cities (Chen et al. 2018).

In acknowledging such challenges, the NUP and the 13th Five-Year-Plan (2016–2020) were turning points in China’s urbanisation, propagating a major shift from the previous land-, property- and GDP-centred growth models into a people-centred approach giving prominence to the “human scale” of urbanisation and quality development, as well as to inclusive and environmentally sustainable urban development. The NUP outlined four main goals, i.e., “promoting the orderly conversion of rural migrants into urban residents,” “optimizing the patterns of urbanisation,” “enhancing the sustainability of cities,” and “promoting urban-rural integration” (Chu 2020).

For example, reforms to the *hukou* system and land management were to be promoted. More specifically, the aim was to “convert” up to 100 million persons, i.e., about 43%, rural migrants, into urban residents, in order to enhance their quality of life. The plan was to provide them with access to vocational training, the purchase of retirement and urban medical insurance, medical services and subsidised housing. Regarding the task of optimizing the patterns of urbanisation, the NUP proposed the development of small towns, cities and city clusters in the inland and western parts of the country in a coordinated way (Chu 2020). Additionally, within the framework of the concept of “ecological civilization”, emphasis was placed on enforcing green space protection, utilising local environmental red lines for urban expansion, and setting urban growth boundaries to restrict cities from growing in an uncoordinated way (Zhang et al. 2019). The possibility of creating compact and mixed-use urban neighbourhoods was explored, as well as the possibility of preserving local culture and historical buildings, expanding public transportation networks and increasing public green spaces in cities. The provision of urban affordable housing was to be improved and accelerated. Environmental protection and ecological preservation were to be strengthened.

In accordance with these objectives, a series of new policies regarding urbanisation and socio-economic development were put forwarded in the following years. For example, the Land Administration Law was amended, aiming at an improvement in land-use patterns, understanding urban and rural areas as one integrated entity and integrated system. Moreover, regulations regarding land-use approval processes and the *hukou* registration system were relaxed in various cities. Nevertheless, top-level reforms need time to be fully implemented and reach the lower levels of government. Thus, China is still in the process of changing its urban face again, and making cities and neighbourhoods more sustainable.

Several authors have assessed the implementation of the NUP in recent years, and confirmed progress (Chu 2020; Chen et al. 2018). However, they have also raised some concerns about the speed of urban development outpacing the achievements of implementation, e.g., regarding rural–urban migration and social benefits for

migrants, or accelerated urban expansion in second- and third-tier cities in inland provinces, promoted by the NUP.

A topic which is examined to a much lesser extent than these issues on the macro-level, is the question of how urban districts and neighbourhoods can be made more sustainable and socially integrative in the future under the conditions of urban expansion and redevelopment. The face of cities is changing dramatically. Greater uniformity and standardisation, with high-rise apartment buildings in urban neighbourhoods with many newcomers from different areas of the city or from the countryside, may lead to more anonymity and anxiety. A new social fabric and social capital are difficult to establish. Institutions which are oriented towards community development, such as Urban Residents Committees (URC) and Street Offices, exist, but they face a number of challenges, such as “participative bureaucratisation” (Audin 2015), and they hardly connect to urban planning and development.

Overall, it is timely to explore further possibilities to control urban expansion and to create socially integrative neighbourhoods in new expansion areas. Although the framework conditions for urban development in China and Europe may differ considerably, it is worthwhile to look at European practice and exchange experiences. This may have positive effects on the improvement in living conditions in new urban areas in China in the post-NUP era.

3. Urban Expansion in Europe

3.1. Types of Urban Expansion

In Europe, there is a long tradition of planned urban expansion. This dates back to the era of industrialisation. Later, new urban areas were developed as a reaction to housing pressures after war devastation and rural-to-urban immigration. More recently, urban expansion has been accelerated due to exploding real-estate housing markets in economic development hubs and in post-socialist countries and regions. Moreover, new demographic trends, e.g., the downsizing of households, and the rise of second home ownership, play a role. The spatial consequences of these trends have resulted in an impressive increase in urban areas all over Europe.

Depending on the scale, location and administrative character, planned urban expansion areas can be categorised into three distinct types (TCPA 2007):

- Urban extension, including the creation of new urban districts, is associated with planned expansions of an already existing city or town at its fringe, with a certain degree of spatial continuity of built-up areas. This may be promoted by private- and/or public-sector interest, on either rural land, which has to be transformed to land for urban use, or on newly reclaimed land (Bjorg 2010; DCLG and TerraQuest 2020). Urban extension is the most common type of urban expansion;

- New towns and settlements are free-standing planned settlements at a certain distance from core cities and with spatial discontinuity in built-up areas, promoted by private- and/or public-sector interest. In Europe, current trends in population development and economic growth do not justify new towns. Nevertheless, there are some cases of this, such as Adamstown, built between 1996 and 2016, at the outskirts of Dublin, Ireland, as a reaction to the sprawl of the capital. This is one of the few examples of independent settlements developed after the Second World War. The town is a 10,000 unit housing development for 25,000 people. Fifteen percent of the units are reserved as affordable housing for socially weak groups in the society. The project is characterised in the literature as a sustainable and vibrant example of a new urban development (Gray et al. 2010; URBED 2008);
- Urban infill corresponds to new developments sited on vacant or undeveloped land within an existing urban area and enclosed by other types of development. It also includes the redevelopment of areas which, over time and with changing economic conditions, fell out of use. The strengths of this type of urban expansion, which is conceptually very close to urban regeneration and renewal, are manifold. They include the possibility of accommodating urban growth within the boundaries of already-urbanised areas, the possible joint use of existing infrastructure and services with neighbouring areas, and revitalisation effects, injecting higher attractiveness and new life into existing communities in the vicinity (McConnell and Wiley 2010; Arvola and Pennanen 2014). However, some researchers also stress that if densities are too high, such developments might threaten the amenities of neighbouring areas, negatively affecting the real-estate values of existing properties and the living quality due to the loss of open space, the decrease in privacy and the loss of parking areas (Ahvenniemi et al. 2018; Arvola and Pennanen 2014). Hammarby Sjöstad, a district located in southern Stockholm, Sweden, is often mentioned as a good practice example. It is seen as one of the most prominent cases of converting a rundown industrial area into a modern, sustainable, and mixed-use neighbourhood (Iverot and Brandt 2011; Evliati et al. 2015; Schiappacasse et al. 2019). The new districts of Kronsberg in Hannover, HafenCity in Hamburg, Stockholm Royal Seaport and Bo01 in Malmö are also considered good practices of large urban infill (Modarress-Sadegui and Konstari 2015; Hicks and Kuhndt 2013; URBED 2008).

These types correspond rather well with the ways in which Chinese cities have expanded, although there are important differences. For example, there is no quota system in Europe. However, the conversion of rural to urban land requires a decision by the local government and a respective delineation in the local land-use plan. Local governments also decide about the handling of short-term additional needs for housing and industry. Urban redevelopment and infill seem to have some common

ground. However, the complete levelling of large old housing or industrial areas is more the exception than the rule in Europe. Finally, the issue of urban villages is also not common in Europe. Once integrated into a local administrative unit, e.g., a municipality, villages come under the full jurisdiction of this entity.

3.2. Urban Development after the Second World War

Urban expansion after the Second World War was highly influenced by the Athens Charter, a manifesto mostly written by Le Corbusier and published in 1943. The document propagated urban expansion and urban development in a new way: “It was essentially a condensed version of the core ideas and principles of modern architecture and urban planning, which called for a total remaking of cities in the industrial world, to make them more efficient, rational, and hygienic.” The Athens Charter “became widely circulated after the war, especially among European governments looking to rebuild devastated cities and house millions of homeless citizens. . . . It became a blueprint for the communist world in the 1950s, 60s, 70s and 80s, especially in the USSR and its East European allies, which sought the most rational and efficient way to plan out housing” (Rubin 2009, p. 1).

Thus, all over Europe and in many other parts of the world, large high-rise housing estates, often with pre-fabricated buildings, became a pattern of urban expansion. Within the framework of massive building programmes, including social housing, large housing estates with hundreds of tower blocks were constructed in the UK (New Towns), in France (Banlieues), in Sweden (Million Programme), in The Netherlands (new housing estates) and in other urban expansion areas all over Europe. The early cases were followed by projects constructed on the fringes of the cities. Later, similar projects were built in East Germany and eastern and south-eastern European cities, for often more than 100,000 inhabitants, recognised as “socialist new towns” (Dekker et al. 2005).

Nevertheless, what looked similar from an architectural perspective proved to be rather different regarding context and function. For example, in West Germany, projects were often linked with social housing programmes, while in East Germany, prefabricated panel housing estates were among the most modern and preferred housing facilities. Despite considerable differences between countries, urban extension projects were characterised by a simple architecture that was considered quite revolutionary in its time. The areas were shaped by large medium- to high-rise blocks, open spaces between blocks and the separation of functions. Apartments were functional, though not always spacious. They were often affordable, and many residents were supposed to be involved in organised community activities, a goal which, however, was not always fulfilled (Dekker et al. 2005).

In parallel and in the course of economic recovery, growing wealth and new consumption patterns after the Second World War, more and more people, especially

young families, had the desire to leave central cities or large housing estates and settle closer to nature, with a better and safer environment for their children. As land prices in small towns and at the urban fringes were considerably lower than in inner cities, owning a property in the outskirts of a city than in the core area was cheaper and more probable. Thus, sub-urban areas grew rapidly. New single-home and detached housing developments were often implemented in the jurisdiction of smaller settlements, and even villages neighbouring larger cities, making it rather difficult to control and manage urban sprawl. In the post-socialist era, similar processes massively occurred in cities of countries in central, eastern and south-eastern Europe.

Additionally, almost everywhere in Europe, demographic decline started to be visible. This was accompanied by urban immigration from foreign countries. The working class, lower income groups in society and unemployed persons started to be deliberately allocated to these areas. The formerly highly appreciated housing estates became social hotspots, and ethnic and social spatial segregation became visible.

As a result, urban policy became more cautious in promoting urban expansion and shifted to urban renewal. Nevertheless, there were also many approaches to regenerate the large housing estates, find solutions for the sometimes severe social conflicts, and to enhance local living conditions. For example, in Germany, the programmes “Stadtumbau Ost” (Urban Reconstruction in East Germany), and later “Stadtumbau West” (Urban Reconstruction in West Germany), focused on injecting new life into and raising the attractiveness of these areas.

Additionally, living in old central urban areas had become fashionable, as heritage preservation and the restoration of historic centres and their extensions during the period of promoterism in the wake of industrialisation had created new, attractive, though rather costly, urban areas in the core cities. Thus, urban renewal became a priority of urban planners and policy makers.

Nowadays, there are still strong trends in Europe of leaving the core city and purchasing property or renting a housing facility at the urban fringe, often considerable distance from the city centres and with substantial commuting times. Consequently, urban extension is still taking place at a rapid pace, especially in economically attractive urban agglomerations, such as in almost all capitals and major economic centres in Europe. Sub-urban and peri-urban areas are perceived as attractive solutions for meeting housing needs, providing better homes and living environments, as well as establishing new industries and commercial facilities.

Moreover, various studies have found that there is a lot of supply-driven land-use change. This can be fuelled by policies at national and local levels, e.g., when “the political agenda or local decision-makers in stagnating or economically declining areas ... emphasises the importance of cheap land for residential or commercial uses as a means to attract people and enterprises and thus generate tax revenue. ...

Some scholars have presented evidence that the institutional fragmentation of local authorities could be another important factor explaining the rate and pattern of land consumption” (Nuissl and Siedentop 2021).

As a consequence, unsustainable urban expansion continues to exist across Europe (EEA 2016). The amount of urbanised land and living space used per person has more than doubled during the last 20 years, leading to both “new edge cities around traditional urban centres and scattered residential developments on the urban fringe” (Gómez-Antonio et al. 2016). Urban extension continues to be a major concern for the European Union, as well as national, regional and local governments in Europe, due to its negative impact on financial, environmental and social aspects.

The discussion about urban expansion has been closely connected to the debate about urban sprawl. The European Environmental Agency (EEA), which promotes the use of the term, describes urban sprawl “as the physical pattern of low-density expansion of large urban areas, under market conditions, mainly into the surrounding agricultural areas” (EEA 2006, p. 6). Others have described it as the spreading of a city and its suburbs over rural land at the fringe of an urban area (Patacchini and Zenou 2009; Stan 2013). In fact, urban growth, urban expansion and urban sprawl overlap to a large degree (EEA 2016, p. 24). The results of the most recent EEA report on urban sprawl in Europe indicate that, despite much effort, “economic development has, largely, not been decoupled from increases in urban sprawl” and its negative consequences (EEA 2016, p. 14).

Besides the widespread land conversion, due to a number of reasons, all over Europe (Nuissl and Siedentop 2021), there are two clusters of high-sprawl in Europe. The first is located in north-eastern France, Belgium, The Netherlands and parts of western Germany. The second stretches in the United Kingdom, between London and the Midlands. In general, sprawl is most pronounced in wide rings around city centres, along large transport corridors, and along many coastlines, especially in the Mediterranean region (EEA 2016). This has not only massively encroached on rural areas but is also endangering the European Natura 2000 network, the largest coordinated network of protected areas in the world.⁶ In many places, this pattern of development has led to serious consequences such as surface sealing, ecosystem fragmentation, land erosion, arable land loss, traffic congestion, transport emission, and social segregation (Schetke et al. 2012; EEA 2006; EEA 2016; Foley et al. 2005).

3.3. Policies to Manage Urban Expansion in a More Sustainable Way

The search for approaches to limit and control urban expansion is not at all a new topic in Europe. There have been many initiatives on the European level, as well as

⁶ https://ec.europa.eu/environment/nature/natura2000/index_en.htm (accessed on 3 September 2020).

programmes and measures on the level of national, regional and local governments, especially in the wake of the international sustainability discussion in the late 1980s. Thus, there is considerable experience with different approaches to manage urban expansion aiming to foster sustainable urban development, and to make cities more environmentally friendly and socially integrative.

For example, in Germany during the 1990s, the national government launched a programme on “Cities of the future” following the results of the Rio Summit. Approaches to adjusting land management, mobility, environment, housing and the economy to the requirements of sustainable urban development were tested in four model, seven reference and 50 further cities. Successful urban development, in contrast with China, was measured against the ability of local governments to limit the uptake of new areas for settlement and transport purposes, intensify land use, protect open spaces and re-use derelict and wasteland for urban development, among other factors. Moreover, the programme focused on the relation between new urban development areas within and outside of existing built-up areas, as well as local abilities to mobilise new land for development within the existing urbanised areas. Regarding social integration, the programme looked, for example, at the possibility of relocating residents from sub-urban areas to core cities, providing basic housing facilities and financial support to individuals for housing, reducing unemployment, strengthening the local economy, and reducing commuting.

Later, limiting the land uptake for settlement and transportation purposes was included as a goal and an indicator in the German Sustainability Strategy in 2002 (see below). Similar programmes and activities were also initiated in other European countries, e.g., in France, England, The Netherlands and in Scandinavia. For instance in 1994, the UK Government published the “Strategy for Sustainable Development”, calling for a more compact urban development that would use less land and enable reduced energy consumption (Couch et al. 2007). In the following years, controlling expansion became a major policy consideration in most European countries (Schiappacasse et al. 2019).

On the European policy level, major concerns regarding urban expansion and social integration became evident in the late 1980s through the “Green Paper on Urban Environment”, published by the European Commission. The document states that “urban growth has spawned vast built-up areas which lack of essential qualities we associate with cities: history, functional differentiation, cultural and other forms of infrastructure These monotonous areas often harbour poverty, crime and drug abuse, problems subject to increase attention from authorities at all levels” (European-Commission 1990, p. 3).

In the following years, a number of documents at the European level proposed concepts and measures to cope with urban sprawl, promote sustainable land use and make urban development more socially integrative (EEA 2016, pp. 18–19):

- In 1999, the European Spatial Development Perspective formulated the necessity of a policy on the “support for effective methods for reducing uncontrolled urban expansion: reduction of excessive settlement pressure” (Committee on Spatial Development 1999). In more detail, the document proposed planning strategies to minimise further urban sprawl by emphasising compact cities and cities of short distances within a regional context. It was stated that, for this purpose, “co-operation between the city and the surrounding country side must be intensified and new forms of reconciling interest on a partnership basis must be found” (Committee on Spatial Development 1999);
- In 2004, the European Landscape Convention by the Council of Europe focused on the objective of promoting the protection, management and planning of landscapes, and organizing international cooperation on landscape issues. The convention aimed to limit urban sprawl by promoting the vision of a compact and green city (Council of Europe 2012). Unfortunately, the European Landscape Convention has still not been signed by all European governments, including those from Austria and Germany;
- In 2007, the Leipzig Charter on Sustainable European Cities set an important basis for the efficient and sustainable use of resources, highlighting the role of spatial and urban planning in preventing sprawl through the strong control of land supply and speculative development. It also strongly promoted social integration in cities (Council of Ministers Responsible for Spatial Planning and Urban Development 2007);
- The Toledo Declaration in 2010, and the Territorial Agenda in 2011, supported the suitability of urban recycling and compact city planning as strategies to minimise land consumption and to control urban sprawl;
- The Urban Agenda for the EU (Pact of Amsterdam), from 2016, promotes sustainable land use as well as social integration, i.e., reduction in poverty, housing, inclusion of migrants and refugees, and security in public spaces (EU Ministers Responsible for Urban Matters 2016). The agenda is operationalised by the respective action plans;
- The New Leipzig Charter of 2020 is the most recent policy document. It is far more than a mere update of the Charter from 2007 (EU Ministers Responsible for Urban Matters 2020). It summarises the European state of thinking in a comprehensive way. It deals with the transformative power of cities for the common good. Hereby, the document acknowledges cities as places of pluralism, creativity and solidarity, and as laboratories for new forms of problem-solving and test beds for social innovation. It promotes integrated urban development as well as participation and the activation of local commitment.

Despite the European Union’s concerns and efforts to tackle urban expansion and sprawl, there is no common policy, as the European Commission has little say in urban affairs. Land-use relationships and the levels of administrative and financial decentralisation differ considerably among European countries. Each country has dealt with sprawl in different ways, such as by fixing specific targets for the middle- and long-term, introducing containment policies and “by either using a strategy of binding legislation (command and control) or applying a market based approach” (Colavitti and Serra 2017, p. 4). What, in general, is perceived as a weakness, may be seen as a strength here: the differences among the European countries provide a universe of distinct approaches and experiences in dealing with urban expansion, which may be useful as a background for shaping new strategies under specific conditions.

4. Approaches to Control Urban Expansion and Promote Social Integration in Urban Expansion Areas in Europe

European countries have established a number of different approaches to control urban expansion, and to promote social integration in new expansion areas. As Figure 1 shows, they can be divided into those addressing urban limits, form and morphology, i.e., by controlling, monitoring, evaluating and limiting urban expansion, and those influencing the internal social fabric of expansion areas, i.e., by promoting social integration. Both are interrelated and relevant for creating socially integrative cities. In the following, both types of approach are discussed. Approaches to promote social integration are of special interest.

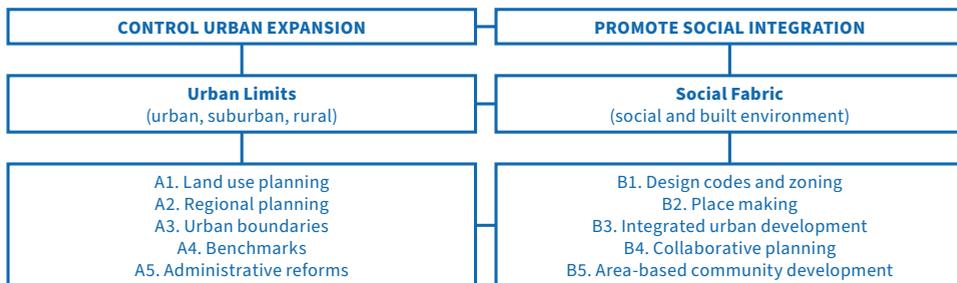


Figure 1. European approaches to control urban expansion and to promote social integration in urban expansion areas. Source: Figure by authors.

4.1. Approaches to Control Urban Expansion

There is a wide variety of approaches to controlling urban expansion. On the one hand, any form of inner-urban development, including urban regeneration, may be interpreted as an approach to limit urban encroachment and sprawl on areas at the urban fringe, as it aims at mobilising new urban development opportunities

within the existing urban fabric, and, thus, diminishing the pressure on a city to physically extend its built-up areas. Public subsidies may help to lower the cost of land conversion, e.g., in cases where polluted soils, e.g., due to former industrial use, have to be exchanged before building can be permitted. Land tax reforms diminishing the role of differences between urban centres and sub-urban municipalities may also have an effect on reducing urban expansion. Although such approaches should not be underestimated, they only have an indirect effect on urban expansion.

On the other hand, there is a diversity of methods to directly control, monitor, evaluate and, thus, limit urban expansion and establish sustainable land-use policies (Nuissl and Siedentop 2021, p. 87). Some of them are well established. Others, such as tradable development rights, are still in an experimental stage, in Europe, e.g., Italy, the Netherlands, Switzerland, Austria and Germany (Proeger et al. 2018), as well as in China (Hou et al. 2018). According to Couch et al., approaches to control urban expansion may (Couch et al. 2007):

- Be regulative, such as spatial planning, restrictions concerning specific land uses, and density controls, e.g., based on monitoring and evaluating urban expansion;
- Be related to institutional change, such as administrative reforms in order to create larger municipalities or to establish new regional authorities;
- Work on the basis of incentives, like the provision of infrastructure and social facilities, subsidies, and taxes, especially in already built-up areas.

In the context of urban expansion and the socially integrative city, five approaches are described below (see Figure 1).

4.1.1. Land-Use Planning

Land-use planning (A1.) plays a crucial role in controlling urban expansion. Depending on the legal stipulations in the different countries, land-use plans generally form the legal basis for any urban expansion, irrespective of the way they are implemented. They define whether land within the jurisdiction of a city or town is rural or urban, and whether it can be taken up for urban extension or not.

For example, German local authorities have powerful instruments to restrict urban expansion, as building is prohibited in areas which are not especially designated for urban development in a land-use plan, i.e., housing, commercial, industrial or mixed-use purposes. Land-use plans define whether and which areas can be taken up for new building activities. They have to be approved by the local parliament, and then have the quality of a local law (Schulze-Baing 2010).

However, planning decisions require majorities in local governments and parliaments, as well as law enforcement and commitment, in order to be effective in controlling urban growth (Fertner et al. 2016). Here, one has to take into account that limiting expansion is often interpreted in the political arena as limiting growth

and development potential. Therefore, it is difficult to achieve. Moreover, what may be seen as detrimental from the perspective of a core city, e.g., growing beyond its own administrative boundaries and losing population and businesses, may be of high interest to a neighbouring smaller municipality, which can profit from urban expansion in terms of inhabitants, employment, infrastructure, services and tax income.

In some countries, landscape-oriented instruments have been used to demarcate urban growth boundaries, such as green corridors or green belts (Nuisl and Siedentop 2021). For example, this planning strategy was part of the post-war approaches in English regional policies to protect farmland and separate conurbations (Horn 2015). Having been discussed since the 1920s, a number of European cities have rather successfully adopted the greenbelt approach, such as London, Copenhagen and Amsterdam, as a component of their local land-use planning, and others as an element of their regional endeavours to limit urban expansion.

4.1.2. Regional Planning

Regional planning (A2.), including the establishment of regional authorities or agencies, is a rather old instrument in some European countries. For example, in Germany, it was introduced in the beginning of the 20th century as the necessity arose to coordinate rapid urban expansion and to safeguard environmental quality in major industrial regions of the country, such as the Ruhr area, in the wake of industrial development.

Regional planning defines the regional development strategies and priority land uses of a region made up of several lower-level administrative entities, such as counties, cities and towns. In countries where the authority to make planning decisions rests exclusively with municipalities, like in Germany, regional plans often use landscape- and nature-based instruments to limit urban expansion, such as priority areas for nature and landscape protection or development, as well as green corridors.

Regional coordination and cooperation to direct and manage urban growth is necessary when urbanised areas expand beyond administrative boundaries. As municipalities have little influence on the land development in a region as a whole, regional planning institutions may fill the gap (Christiansen and Loftsgarden 2011). To be effective, regional authorities or agencies must have at least three conditions: a legal basis with clear and sufficient regional competences, compliance among different levels of planning, and a consensus on strategies and visions.

However, it has been noted that, in many cases, the legal authority of regional planning institutions does not always go far enough to control sprawl effectively. For example, in the northern German state of Schleswig-Holstein, the population in the so-called central places, i.e., cities and towns, which were supposed to concentrate

the bulk of urban growth, grew only by 6.5% between 1970 and 1997, while in non-central places, the population grew by 20.7% in the same period (Hahne and Rohr 1999).

Moreover, it is vital that regional and local level institutions work hand-in-hand. For example, “several cantons and municipalities in Switzerland implemented rigorous limitations and sometimes the de-zoning of building zones, and achieved a stabilisation or reduction of sprawl.” In this way, in the Canton of Geneva, a 33% reduction in sprawl was achieved between 1980 and 2010 (EEA 2016, p. 115).

Well-known European examples for regional approaches to limit urban extension are Haaglanden in the Hague Region in The Netherlands, the Greater Manchester Combined Authority in the United Kingdom, the Montpellier Méditerranée Metropole in France and different Regional Planning Authorities in Germany (Fertner et al. 2016; Dieleman and Wegener 2004). A prominent example of a successful regional cooperation is found in the Randstad in The Netherlands. There, it has been possible to prevent the rapid development of urban sprawl into highly valued rural areas, an economic powerhouse of the country, despite the fact that land-use planning has to be coordinated among four different regions and more than 150 municipalities (Christiansen and Loftsgarden 2011). Moreover, the regions of Stuttgart, Frankfurt, and Hannover in Germany are also interesting cases to look at because of their rather effective regional planning instruments and innovative intermunicipal cooperation models.

4.1.3. Urban Boundaries

Urban boundaries (A3.) are usually set by local land-use plans. They are used to restrict building activities, which is especially important in countries where private property rights prevail. Their objectives are twofold: to promote compact, contiguous and accessible development, and to preserve open spaces, such as agricultural, forestry and environmentally sensitive areas, that are not suitable for urban development (Nelson and Sanchez 2005). In general, three major forms of urban boundaries are distinguished: green belts, urban growth boundaries and urban service boundaries.

A green belt, is “a zone of land around the city where building development is restricted” (Amati and Yokohari 2006) unless it serves agriculture, forestry or recreation purposes. It constitutes a spatial barrier to urban expansion by means of planning control and physical implementation. Green belts are considered “one of the most restrictive policy instruments of urban containment” (Siedentop et al. 2016) as they support compact development and encourage developers to recycle derelict urban land. For example, “the cantonal master plan of Zurich of 2014 has implemented 73 green belts in which construction is prevented” (EEA 2016, p. 115). However, research findings show that the success of the green belt approach for containing

development is very dependent on the relationship between the government and the market, as well on the prevailing conditions for land development (Horn 2015).

In contrast to green belts, an urban growth boundary is a line drawn around a municipality or a city-region with urban uses accommodated inside and rural uses outside. Limits are not permanent, and they can be reassessed and extended to accommodate expected growth (Zacharoula 2013). In the Netherlands, cities and local authorities apply a system of red and green contours to accommodate future development within a certain time (2030). Local authorities recommend the line's location to the provincial governments, who have the final decision (Horn 2015).

An urban service boundary is defined as an area beyond which no urban services, such as sewer, water and transportation, will be extended (Zacharoula 2013). Urban service boundaries are more flexible than urban growth boundaries, because they are often drawn to be consistent with the planned urban facilities, while urban growth boundaries respond more to policy objectives. While the latter instruments are commonly used in the United States, in Europe, the main instrument to control urban sprawl is spatial planning, including land horizon use and regional planning. Moreover, "there is a broad debate in the US as well as in the UK on whether the definition of a rigid boundary around a settlement is . . . the most effective means for curbing urban sprawl and its associated negative impacts" (Nuissl and Siedentop 2021, p. 90).

4.1.4. Benchmarks

Benchmarks (A4.) are an element of persuasive approaches to control urban expansion. They usually aim at limiting urban extension within a given medium- to long-term period. Many European countries have experience in setting benchmarks for limiting sprawl.

In Germany, the National Sustainability Strategy of 2002 introduced the objective that, until 2020, the land "consumption" for settlement and traffic purposes was to be reduced from about 120 to no more than 30 hectares per day. However, it has been noted that the German government has implemented only a few measures to achieve this target (EEA 2016). Nevertheless, many state and regional strategies in Germany broke down the national figures and formulated regionally adapted general objectives in their spatial plans. In some cases, cities were also incentivised to embark on strategies to limit land conversion for urban development, e.g., on the way of urban living labs, i.e., model projects and competitions, which included the exchange of experience among the participants. All this spurred public discussion and changed the mindsets of decision-makers, although the target as such could not be reached. In Switzerland, there were attempts in 2018 to push a regulation according to which no new urban expansion would have been possible.

In general, setting benchmarks is a valuable approach which has the potential to foster public debates about objectives and ways to reach them. Moreover, they are an element of learning systems in societies. This requires the implementation of efficient and up-to-date monitoring which, in many countries, is still in its infancy. However, benchmarks usually do not have legally binding force. Thus, it is not surprising that no European country has been able to establish an effective quantitative limit for sprawl (EEA 2016).

4.1.5. Administrative Reforms

Administrative reforms (A5.) to change the jurisdictions of local governments, including the annexation and amalgamation of local authorities and the creation of new upper-tier regional-metropolitan authorities, are an option to increase the spheres of influence of local entities, to broaden the tax base and to increase planning and implementation capacities. Moreover, the efficiency, effectiveness and equity of inter-municipal action can be improved (Pichler-Milanovic 2007).

It is a shared understanding in Europe that administrative reforms may help to better control and manage urban expansion and to promote compact development. However, they are not easy to implement due to the resistance of smaller municipalities and the political sensitivity of such reforms on higher levels of decision-making, which usually have the final say.

Whether administrative reforms can successfully be implemented or not depends, to a high degree, on the level of sovereignty of municipalities and local governments. Moreover, the decisiveness of upper-level governments to conduct administrative reforms plays a big role. Historical and traditional bonds usually play an important role, as it is often argued that administrative reforms contribute to destroying local culture, social ties and the sense of place. Although experience indicates that metropolitan municipalities have not always contributed to the protection of open spaces and the control of urban sprawl (Razin 1998), administrative reforms lay the foundation for better controlling urban expansion.

4.2. *Approaches to Promote Social Integration in Urban Expansion Areas*

There are a number of approaches in Europe, which can be and have been successfully applied in order to make urban expansion, once decided on and unavoidable, more socially integrative, as defined in Chapter 2 of this book. They range from opportunities for detailed planning and design to integrated multi-sectorial, as well as communicative and collaborative, approaches. Five of them are described here.

4.2.1. People-Based Design Codes and Zoning

Design codes and zoning (B1.) are planning instruments describing the detailed form and internal structure of future urban development areas (Couch et al. 2007). For example, they may determine the street layout, plot sizes, building limits, building heights, the orientation of buildings, and further details concerning the outer appearance of buildings, even up to the question of which colours are permitted. Moreover, planners decide about the social infrastructure, e.g., schools, community centres, libraries, sports facilities, and green infrastructure as well as commercial areas and office buildings, including potential co-working facilities and maker spaces. Design codes and stipulations for zoning provide basic rules for the detailed design of new urban areas.

These are important tools to promote communication and social interaction, as well as to foster favourable living conditions within a neighbourhood. For example, they may include rules for the design of open spaces and public areas, and the question of which community facilities are to be established. They may provide rules regarding affordable housing, the “human dimension” of the built environment and mixed-use areas, and they may include stipulations regarding internal traffic, connectivity and access to public transport facilities.

Depending on the stipulations, new neighbourhoods become more or less socially integrative, more or less socially mixed, and more or less open and communicative. They may be exclusive if, for example, plot sizes are too large and the design favours large single-family homes. They may be dull and uninspiring if there is no variation in design. Nevertheless, design codes and stipulations for zoning are always a reflection of the preferences of a society, and, more specifically, a local community, and preferences change over time.

Good practice examples have demonstrated that it is advisable to establish the design codes and detailed zoning plans in a collaborative way with, if possible, the engagement of future inhabitants and representatives of local civic groups. This may not guarantee, but raises the probability of, a new neighbourhood becoming socially integrative as a response to customised solutions enhancing local identity.

Upton, an extension area of Northampton in the United Kingdom, can be taken as a good practice example here. After a participatory process of discussing the aspirations and needs of future inhabitants, a design code was elaborated and included in the developer procurement brief for each parcel of land to be released. (Communities and Local Government 2006). Overall, the design code ensured coordination between the different development sites within Upton and provided certainty to developers of the quality and character of adjacent development (TCPA 2007).

Similar results regarding the development of a vibrant and diverse new development area were achieved in Rieselfeld, located in the southwestern German

city of Freiburg, which were zoned based on intensive consultation processes in working groups and local community forums, offering critical support to the city council. For example, the city and the inhabitants agreed that a bigger portion of the plot was to be converted into an urban preservation area while a smaller portion was oriented towards urban development (Schuetze 2019).

4.2.2. Place-Making

Place-making (B2.) is “the set of social, political and material processes by which the people iteratively create and recreate the experienced geographies in which they live” (Pierce et al. 2010, p. 54). According to this approach, social integration is fostered through a collective, consensus-building and decision-making process based on progression through argument and discussion. More than just promoting a better urban design, place-making pays particular attention to the physical, cultural and social identities that define a place and support its ongoing evolution. Based on Healey’s ideas of collaborative planning (Healey 1997), Hall and Rowlands (2005, p. 51) propose the following five dimensions of place-making: integration in policy making; collaboration in policy making; stakeholder involvement; local knowledge; building relational resources.

Thus, place-making contributes to the inhabitants’ identification with the place they live. It also encourages people to become actively engaged in shaping the future of their living environment through a collective process and in a collaborative way. It provides opportunities to self-actualise. It promotes dialogue and joins action across social barriers. The support of respective local initiatives may be favourable for reaching these goals.

The importance of public space as a base for integrative cities is recognised at the international level, e.g., in the Sustainable Development Goals and the New Urban Agenda of the United Nations, as well as on the European policy level. This is reflected in an increasing number of documents and place-making networks, as well as institutions, which are founded across Europe (Laven and Bradley 2019).

The examples of Upton and Rieselfeld demonstrate that the active engagement of citizens in planning processes can stimulate place-making and the self-identification of inhabitants with their area. In another case, Vathorst, an urban extension of Amersfoort in The Netherlands, difference and variety was expressed in the masterplan, with the title ‘A World of Difference’. The detailed plan consisted of different neighbourhoods, each of one with a distinctive character (URBED 2008; Cousins 2009). Eight different builders and around 50 different architects were involved. The individual development areas were quite small, with a maximum of 70 to 80 homes developed by one architect to ensure choice and variety (URBED 2012).

4.2.3. Integrated Urban Development

Integrated urban development (B3.) plays an important role in enhancing social integration. This refers to a comprehensive understanding of developing urban expansion areas, involving stakeholders from multiple sectors. This is a substantial change compared to the approaches followed some decades ago, when area-based planning and interventions in Europe mainly addressed the physical arrangements of urban development (Díaz et al. 2016). There are many European countries, which have introduced comprehensive national programmes for integrated urban development, e.g., Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Sweden, Switzerland and the United Kingdom (Federal Minister of Transport, Building and Urban Development 2012).

According to the German Institute for Urban Studies (Difu), quoted by the German Association of Cities (Deutscher Städtetag 2013, p. 9), urban development planning is “project oriented and implementation oriented, has a city-wide and/or more localised perspective, tends to be oriented towards combining sectoral objectives in an integrated context, and is characterised by a wide range of governance forms.” It is “an informal, target-oriented and implementation-oriented strategic control instrument. Increasing uncertainty factors in forecasts and increasingly rapid changes in the framework of global and regional conditions are creating a growing need for adaptable strategies and planning processes. With its cooperative methods, integrated urban development planning broadens the system of . . . planning and opens it up not only to civic engagement and participation, but also to market-oriented forms of action (e.g., urban development contracts, PPP, private-public project companies). . . . Today, strategic and integrated urban development planning has become an essential precondition for efficient, future-oriented exercise of local authority planning powers” (Deutscher Städtetag 2013, p. 10).

An advantage of integrated urban development planning is that it provides a strategic vision with a long-term planning perspective for a whole city. It identifies specific priority action areas and defines the measures to be implemented. It fosters inter-sectorial collaboration and understanding, which is an appropriate response to planning and development challenges in times of increasingly interconnected and complex urban development processes. Lately, more and more programs have followed an integrated perspective, giving special attention to a combination of physical, environmental, social and economic measures. This has been vital for urban regeneration, but it is increasingly applied in cases where urban expansion is principally questioned for reasons of sustainability. One of the major issues of the approach is to draw all stakeholders together: citizens, public authorities, developers, trade associations, industries and academia. Additionally, a multi-disciplinary collaboration of between political and administrative levels, i.e., EU, national, regional

and local, is seen as crucial to maximise the impact of the interventions and reinforce the mutual benefits of the different projects.

Again, the previously mentioned examples of Upton, Vathorst and Rieselfeld can be taken as good practice examples here. For instance, in Rieselfeld, the local government applied an integrated urban development approach throughout the whole planning and implementation process. The integration of sectoral objectives included multi-modal transportation linkages, low-energy construction, district heating networks fed by a shared heat and power plant, the integration of solar energy, and a concept for ecological storm water management and rainwater use. Mixed land use provided advantageous living and working conditions in a city of short distances. Housing schemes ensured that a wide variety of income and age groups, including low-income groups and elderly persons, had access to housing in the area. The provision of local schools and green areas attracted young families. A variety of shops helped meet the everyday needs of the population. The social and cultural infrastructure encouraged social interaction (City of Freiburg 2012; Hoppe et al. 2008; Fastenrath and Preller 2018). Overall, the integrated urban development helped to create a vibrant and liveable community, with a balanced social mix, good connectivity, high-quality design and a green infrastructure network.

4.2.4. Collaborative Planning

Collaborative Planning (B4.) is an approach to the development of places in an inclusive and participatory manner. Despite already being a common practice in many cities, the approach was academically promoted by Patsy Healey in the 1990s (Healey 1997). Accordingly, planning should be done through face-to-face discussion and collaboration among those who have direct interests in or are directly affected by the planning results, e.g., within the framework of an urban expansion project. Following Innes and Booher, dialogue, networking and institutional capacity are key factors to maximise the effects of collaborative planning (Innes and Booher 2000, pp. 18, 19).

Nevertheless, the approach has also certain weaknesses. Usually, participation and collaboration are long and often complicated processes, which rarely show quick results. Moreover, the unrealistic assumption that conflicts would fade away and all problems could be solved through the exchange of ideas has been criticised (Holvandus 2014, p. 9). Nevertheless, the approach has proven to be a very successful in Europe.

Since the last decades of the 20th century, collaborative planning has become increasing popular, especially in the United Kingdom. For instance, in Upton, the local council and The Prince's Foundation carried out two "Enquiry by Design" processes

in 1999 and 2001.⁷ The events allowed participants to articulate their aspirations for the upcoming urban expansion area. The final result of this collaborative planning exercise was a revised, socially integrative urban framework for the area (TCPA 2007; The Scottish Government 2010). Collaborative planning in Rieselfeld included the active involvement of citizens in a design competition. The winning proposals formed the basis for the design of the project, which incorporated the concerns of women and families, as well as of handicapped and elderly people (Siegl 2009).

4.2.5. Area-Based Community Development

Area-based community development (B5.) defines an area, rather than a sector or target group, as an entry point for social integration. Community members are seen as active change agents rather than passive beneficiaries or clients, participating in the decisions that are made to upgrade their places or improve their quality of life. The objective is to create “the conditions for a just, inclusive and sustainable society by supporting communities to engage in collective action” (European Community Development Network 2014, p. 5).

Methods include community meetings, festivals and streets gatherings, conflict resolution, story dialogue, focus groups, future visioning, alliance building, and engaging with public bodies. For example, in Wester Hailes, Scotland, a peripheral housing estate of Edinburgh characterised by high unemployment, low levels of educational attainment and social pathologies, the Wester Hailes Health Agency has a long-standing tradition of working with local people to tackle health and other inequalities. The organisation ensures that the voices of local people are reflected in its strategic work with health services and the local authority (European Community Development Network 2014).

Similarly, in the Rieselfeld expansion area in Freiburg, community development played an important role in guiding the planning process, even before the new urban area was developed. The involvement of the future inhabitants in planning strengthened the sense of ownership of the new urban expansion area, and it contributed to creating a diverse urban district, both physically and socially. For the work within the district, a charitable association, “Quartiersarbeit von K.I.O.S.K”, an acronym for Contact, Information, Organisation, Self-Help, Culture, was established. The association became a point of address for the diverse planning stakeholders and simultaneously received residents’ suggestions and requirements on diverse issues. The opening of a K.I.O.S.K. shop containing a post office and bakery during the construction stage of Rieselfeld provided a central contact point

⁷ The Prince’s Foundation is an educational charity, established in 1986 to improve the life quality of people by teaching and practicing ecological ways of planning, designing and building.

for the new residents. Moreover, third-party funds, e.g., for job creation schemes, employment promotion and research, could be mobilised, and many people could work on the project continuously.⁸ In 2003, the new district meeting point “Glashaus” was inaugurated including a media library, a café and youth rooms.⁹

The community development process conducted in Rieselfeld has helped to increase the sense of ownership at an early stage of planning, which contributed to the wide acceptance of the project, both in the political realm and in the city district itself (Mahzouni 2018). K.I.O.S.K. has been an incubator for promoting social integration since its beginnings.

5. Conclusions: New Impulses for Controlling Urban Expansion and Promoting Social Integration in Urban Expansion Areas in China?

As in many parts of the world, urban expansion in Europe and China has mainly been driven by economic factors. Both determinants of urban development, urban land use and economic growth, are closely coupled. However, in recent decades, discussions in Europe have focused on ways to limit urban sprawl for the sake of sustainable development and climate change mitigation. On the contrary, rapid urban growth is still in full speed in China. The Chinese national government has supported urban expansion in order to foster economic growth and modernisation in the country, although recently, concerns regarding housing oversupply and endangered food security due to the loss of fertile farmland have been growing. Local governments have profited a lot from expansion policies, as they have been able to generate large parts of their income through auctioning land-use rights to developers.

With the NUP, the Chinese government has initiated a turnaround, from “high-speed” to “high-quality” and from “land-centred” to “people-centred” urban development. This largely coincides with growing social concerns in European countries and with the focus on people-centred and environmental policies in the European Union. Moreover, many cities have carried out local urban development experiments in this regard, and there is a plethora of experiences to share.

This article has taken a closer look at European socially integrative urban expansion practices. After a thorough analysis of urban expansion processes in China and Europe, types of urban expansion and approaches to limit the encroachment of urbanised area on rural land were identified and discussed. There are many differences in detail, e.g., regarding legal instruments and concrete measures.

⁸ https://www.nationale-stadtentwicklungspolitik.de/NSP/SharedDocs/Projekte/WSProjekte_ENG/Freiburg_Rieselfeld_QuartiersaufbauRieselfeld.html (accessed on 12 July 2020).

⁹ <http://kiosk.rieselfeld.org/glashaus/> (accessed on 12 July 2020).

However, in general, the approaches to limit urban expansion have proven to be rather similar.

Urban land-use planning plays a big role in Europe and in China. In China, it is a decisive instrument for encouraging and controlling the growth of cities. It goes hand-in-hand with land policies and respective land management instruments to limit the conversion of rural into urban land. Urban masterplans may have to be re-visited in order to strengthen quality-oriented urban development approaches, placing emphasis on urban design principles fostering diversity and local identity, and to link urban planning more closely with more flexible and sustainability-oriented land management practices.

Regional stipulations, e.g., regarding spatial growth limits or land quota, have an influence in many European and Chinese cities. Containment targets may provide a general framework for action. Administrative reforms in Europe have helped to create larger regional entities, which, in China, already largely correspond to the "city" notion as such. Chinese cities usually extend over a rather large territory, which, besides the central urban area, comprises large surrounding rural areas with smaller cities, towns and villages. Administrative reforms may provide better opportunities for land-use control, but they also may encourage local governments to expand even faster and farther, particularly in less dynamic cities.

Finally, other new approaches to limit urban expansion and sprawl, such as tradable development rights, are under discussion or experimental application in both parts of the world. Without going into further detail and discussion here, there are signs that China is rather open to encouraging respective large-scale experiments in some of its cities. For example, the national government has authorised a number of provincial-level governments, among them large-scale cities like Chengdu and Chongqing, with their 18 and more than 40 counties and districts, respectively, to develop their own land quota markets or related systems. In these cases, quotas can be traded across jurisdictions, albeit within certain administrative boundaries, or banked for future use (Xiao and Zhao 2015). However, in such cases, one should be aware of the dimensions of large-scale pilot experiments in China in comparison to European examples. The City of Chengdu stretches over a little less than 15,000 km², i.e., precisely 14,335 km², which equals almost half of the size of Belgium. The area of the City of Chongqing is more than 82,000 km², i.e., precisely 82,402 km², is almost equal to the size of Austria. There are also many possibilities and good practice examples in Europe and China of fostering social integration in urban expansion projects. However, in both parts of the world, they are not yet mainstream. As the good practice examples from Europe demonstrate, creative, people-based design codes and zoning plans can help to avoid uniformity of urban expansion areas. Related experiments, involving the local population, have also started to be implemented in Chinese cities at the local level. Such endeavours could be

supported by Urban Planning Exhibition Halls, which exist in all large Chinese cities. Instead of limiting their role to mere, though impressive, showcases, or information and education centres regarding urban development, they could take over supportive functions concerning beginning public debates about future options for urban development and encourage public participation in designing the future of their urban environment.

The division of large development areas into smaller parts, and the respective involvement of multiple planning entities and developers, can raise competition and innovation within one development area. It can also help to avoid or get away from uniform solutions to urban expansion. While there are several good practice examples in Europe, the adaptation of similar approaches may be much more difficult in China. This is, on the one hand, due to centralised planning processes where masterplans for strategic urban development areas and projects are designed by a relatively small number of planning institutions, which seem to apply a limited array of design principles. On the other hand, one has to take the interests of large urban development firms into account, which are used to develop and implement large-scale projects rather than small-scale urban development projects. Nevertheless, ongoing experiences with urban renewal activities of much smaller sizes may have an impact on urban expansion approaches in the future.

The participation of future residents in the design may foster identity and a sense of place. Place-making is of the utmost importance to create quality public areas, which attract inhabitants and foster communication and social interaction. This is a point of special relevance not only in Europe but also in China, where the people-centred urbanisation is geared towards more active involvement of local communities in urban development. However, to date, it has not been clear which level of public participation in urban development, i.e., information, consultation or decision-making, China is looking for.

Integrated urban development planning will draw the attention of authorities and developers from the “construction of” to “living in” an expansion area. Nevertheless, it requires a lot of cooperation and coordination of the different stakeholders involved in urban development, including public authorities, developers and service providers. There is ample experience in Europe and in China in bringing different stakeholders together. Nevertheless, approaches are needed which are strategic and flexible at the same time, i.e., which allow the development of long-term visions, and keep options open to adjust to short-term necessities.

Collaborative planning at an early stage of developing new urban expansion areas, which involves all stakeholders, including residents, lays the foundation for the provision of new opportunities to build up social capital and joint understanding. This is a lesson from related projects in European cities. Wherever citizens were directly involved at an early stage in the design of new urban expansion areas, these

areas became more people-oriented and geared towards satisfying the expressed needs of their future population. In China, there are some attempts to involve residents in urban planning more intensively. However, related model projects are still primarily oriented towards urban renewal. European good practice examples demonstrate that intensive public participation in urban expansion is a worthwhile undertaking, which can contribute to making new expansion areas more socially integrative from the beginning.

Finally, community development, which goes beyond the activities of the existing Street Offices and Urban Residents Committees in China, may foster more interest by residents in urban-development-oriented social interaction, create social capital, help inclusion, and enhance empowerment and self-reliance in new urban expansion areas. However, before tackling the Committees' potential in this regard in China, certain challenges would have to be dealt with (Audin 2015). These include the creation of a fair sharing system in terms of budgeting with upper-level authorities, which is accordingly fitted to their respective responsibilities and services. Moreover, they would have to be appropriately equipped and prepared for the new additional task.

The examples of Rieselfeld in Freiburg (Germany), Vathorst in Amersfoort (The Netherlands), and Upton in Northampton (United Kingdom), and others, which stand for a plethora of many more recent good practice examples in Europe, have demonstrated that approaches to create socially integrative cities are no longer just theory, but also a well-acknowledged practice and reality in many countries. They help to customise new urban areas according to the aspirations and needs of their inhabitants. Overall, they guarantee not only favourable living conditions, but also well-being, liveliness and social interaction in new urban expansion areas, thus substantially contributing to urban sustainability.

Author Contributions: P.S. is the main author. She was responsible for field research and the interpretation of information. She wrote the first draft of the article and commented on the second draft. B.M. participated in fieldwork, commented on the first draft and prepared the second draft of the text. P.S. and B.M. contributed equally to the writing of the final text. J.C. organised and participated in fieldwork activities, and worked on the Chinese part of the article. He commented on the first and second draft of the article and contributed to the final text. E.M. contributed text on the Chinese situation during the whole elaboration process.

Funding: This research was funded by the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 770141.

Acknowledgments: The authors want to thank the editors of the book for their comments and suggestions.

Conflicts of Interest: The authors declare no conflict of interest. The founding sponsors had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, and in the decision to publish the results.

References

- Ahvenniemi, Hannele, Kyösti Pennanen, Antti Knuuti, Anne Arvola, and Kauko Viitanen. 2018. Impact of infill development on prices of existing apartments in Finnish urban neighbourhoods. *International Journal of Strategic Property Management* 22: 157–67. [CrossRef]
- Amati, Marco, and Makoto Yokohari. 2006. Temporal changes and local variations in the functions of London's green belt. *Landscape and Urban Planning* 75: 125–42. [CrossRef]
- Arvola, Anne, and Kyösti Pennanen. 2014. *Understanding Residents' Attitudes Towards infill Development at Finnish Urban Suburbs*. Barcelona: World Sustainable Building Conference.
- Audin, Judith. 2015. Governing through the neighbourhood community (Shequ) in China. *Revue Française de Science Politique* 65: 85–100. [CrossRef]
- Bjorg, Hilda. 2010. *New Town Development. A New Approach in Planning for New Towns*. A case study of urban growth of Almere, The Netherlands. Master Landscape Architecture and Planning, Land Planning Group, Wageningen University, Wageningen, The Netherlands.
- Cai, Yongshun. 2002. The resistance of Chinese laid-off workers in the reform period. *The China Quarterly* 170: 327–44. [CrossRef]
- Chen, Mingxing, Weidong Liu, Dadao Lu, Hao Chen, and Chao Ye. 2018. Progress of China's new-type urbanization construction since 2014: A preliminary assessment. *Cities* 78: 180–93. [CrossRef]
- Christiansen, Petter, and Tanja Loftsgarden. 2011. *Drivers behind Urban Sprawl in Europe*. Oslo: Institute of Transport Economics.
- Chu, Yin-wah. 2020. China's new urbanization plan: Progress and structural constraints. *Cities* 103. [CrossRef]
- City of Freiburg. 2012. *Freiburg Charter. Requirements on Urban Development and Planning for the Future*. Freiburg: City of Freiburg and the Academy of Urbanism.
- Colavitti, Anna Maria, and Sergio Serra. 2017. The transfer of development rights as a tool for the urban growth containment: A comparison between the United States and Italy. *Papers in Regional Science* 19. [CrossRef]
- Committee on Spatial Development. 1999. *ESPD European Spatial Development Perspective*. Brussel: European Commission.
- Communities and Local Government. 2006. *Preparing Design Codes. A Practice Manual*. London: Department for Communities and Local Government.
- Couch, Chris, Lila Leontidou, and Karl-Olov Arnstberg. 2007. *Urban Sprawl in Europe. Landscape, Land Use Change and Policy*. Edited by Chris Couch, Lila Leontidou and Gerhard Petschel-Held. Oxford: Blackwell, pp. 1–38.
- Council of Europe. 2012. *Landscape Facets. Reflections and Proposals for the Implementation of the European Landscape Convention*. Strasbourg: Council of Europe.
- Council of Ministers Responsible for Spatial Planning and Urban Development. 2007. *The Leipzig Charter on Sustainable Cities*. Leipzig: European Union.
- Cousins, Matthew. 2009. *Design Quality in New Housing*. New York: Taylor & Francis.

- DCLG, and TerraQuest. 2020. Planning Portal, Glossary. *PortalPlanQuest*. June 10. Available online: https://www.planningportal.co.uk/directory_record/565/urban_extension (accessed on June 10 2020).
- Dekker, Karien, Stephen Hall, Ronald van Kempen, and Iván Tosics. 2005. Restructuring large housing estates in European cities: An introduction. In *Restructuring Large Housing States in Europe*. Edited by Ronald van Kempen, Karien Dekker, Stephen Hall and Iván Tosics. Great Britain: The Policy Press, pp. 1–19.
- Deutscher Städtetag. 2013. *Integrated Urban Development Planning and Urban Development Management—Strategies and Instruments for Sustainable Urban Development*. Hannover: Board of the German Association of Cities Hannover, March 22.
- Díaz, César, Pere Ravetllat, Pilar Garcia, Cossima Cornadó, and Sara Vima. 2016. Refurbishment in Large Housing Estates: A Review on Restructuring and Upgrade. *Procedia Engineering* 161: 1932–8.
- Dieleman, Frans, and Michael Wegener. 2004. Compact City and Urban Sprawl. *Built Environment* 30: 308–23. [CrossRef]
- EEA. 2006. *Urban Sprawl in Europe. The Ignored Challenge*. Edited by European Commission. Luxembourg: European Environmental Agency.
- EEA. 2016. *Urban Sprawl in Europe. Joint EEA-FOEN Report*. Edited by European Environment Agency. Luxembourg: European Environment Agency.
- EU Ministers Responsible for Urban Matters. 2016. *Establishing the Urban Agenda for the EU 'Pact of Amsterdam' Amsterdam*. Amsterdam: European Union.
- EU Ministers Responsible for Urban Matters. 2020. The New Leipzig Charter. The Transformative Power of Cities for the Common Good. Available online: https://ec.europa.eu/regional_policy/sources/docgener/brochure/new_leipzig_charter/new_leipzig_charter_en.pdf (accessed on 26 December 2020).
- European Community Development Network. 2014. *Community Development in Europe. Towards a Common Framework for Understanding*. European Community Development Network. Available online: <http://eucdn.net/wp-content/uploads/2014/10/2014-24-09-EuCDN-Publication-FINAL.pdf> (accessed on 2 September 2020).
- European-Commission. 1990. Green Paper on the Urban Environment. In *COM (90) 218 Final*. Brussels: European Commission.
- Evliati, Maria A., Örjan Svane, and Josefin Wangel. 2015. *How to "Renew a New City District"? The Citizens' Initiative HS2020 in Hammarby Sjöstad, Stockholm*. Lisbon: European Network of Housing Research.
- Fastenrath, Sebastian, and Bérénice Preller. 2018. Freiburg: The Emblematic Green City. In *Green Building Transitions*. Cham: Springer, pp. 69–98.
- Federal Minister of Transport, Building and Urban Development. 2012. *5 Years after the Leipzig Charter—Integrated Urban Development as a Prerequisite for a Sustainable City*. Edited by Bau und Stadtentwicklung Bundesministerium für Verkehr. Berlin: Bundesministerium für Verkehr, Bau und Stadtentwicklung.

- Fertner, Christian, Gertrud Jorgensen, Thomas Nielsen, and Kjell Nilsson. 2016. Urban Sprawl and growth management-drivers, impacts and responses in selected European and US cities. *Future Cities and Environment* 2: 13. [CrossRef]
- Foley, Jonathan, Ruth S. Defries, and Gregory P. Asner. 2005. Global consequences of land use. *Science* 309. [CrossRef]
- Gao, Yuan, Sina Shahab, and Negar Ahmadpoor. 2020. Morphology of Urban Villages in China: A Case Study of Dayuan Village in Guangzhou. *Urban Science* 4: 23. [CrossRef]
- Gómez-Antonio, Miguel, Miriam Hortas-Rico, and Linna Li. 2016. The Causes of Urban Sprawl in Spanish Urban Area: A Spatial Approach. *Spatial Economic Analysis* 11: 219–47. [CrossRef]
- Gray, Paddy, Erick Guerra, John Driscoll, Ursula McAnulty, and Peter Shanks. 2010. *A Case Study of Adamstown*. Dublin: South Dublin County Council.
- Hahne, Ulf, and Götz Rohr. 1999. Some approaches to developing the central places system in Schleswig-Holstein. *Raumforschung und Raumordnung* 57: 143–154. [CrossRef]
- Hall, Stephen, and Rob Rowlands. 2005. Place making and large estates: Theory and practice. In *Restructuring Large Housing Estates in Europe*. Edited by Ronald van Kempen, Karien Dekker, Stephan Hall and Iván Tosics. Great Britain: The Policy Press, University of Bristol, pp. 47–62.
- Healey, Patsy. 1997. *Collaborative Planning: Shaping Places in Fragmented Societies*. Vancouver: UBC Press.
- Hicks, Cheryl, and Michael Kuhndt. 2013. Emergent futures? Signposts to sustainable living in Europe and pathways to scale. In *The Global Challenge of Encouraging Sustainable Living*. Edited by Shane Fudge, Michael Peters, Seteven M. Hoffman and Walter Wehrmeyer. Cheltenham/Northampton: Edward Elgar Publishing, Limited, pp. 85–105.
- Holvandus, Johanna. 2014. *Collaborative Planning Practice in Tallin, Estonia: The Role and Viewpoint of Neighbourhood Association*. Tartu: Department of Geography, University of Tartu.
- Hoppe, Klaus, Christine Klas, and Maryke van Staden. 2008. *City of Freiburg, Germany, European City*. Environmental Protection Office Department. Freiburg: City of Freiburg.
- Horn, Anele. 2015. Urban Management Best Practices: Towards Implications for the developing world. *International Planning Studies* 20: 131–45. [CrossRef]
- Hou, Jun, Hon Wan Edwin Chan, and L. H. Li. 2018. Transfer of development rights as an institutional innovation to address issues of property rights. *Journal of Housing and the Built Environment* 33: 465–79. [CrossRef]
- Hui, Eddie, and Haijun Bao. 2013. The logic behind conflicts in land acquisitions in contemporary China: A ramework based upon game theory. *Land Use Policy* 30: 373–80. [CrossRef]
- Innes, Judith E., and David E. Booher. 2000. Public Participation in Planning: New Strategies for the 21st Century. Paper presented at Annual Conference of the Association of Collegiate Schools of Planning, Greenville, NC, USA, November 2–5.

- Iverot, Sofie, and Nils Brandt. 2011. The development of a sustainable urban district in Hammarby Sjöstad, Stockholm, Sweden? *Environment, Development and Sustainability* 13: 1043–64. [CrossRef]
- Laven, Jeroen, and Anna Bradley. 2019. Placemaking in the European context. The movement is here to stay. *The Journal of Public Space* 4: 135–54. [CrossRef]
- Li, Xin. 2018. *Residents' Perceptions of Impending Forced Relocation in Urban China: A case study of state-led urban redevelopment in Shenyang*. Delft: Faculty of Architecture and the Built Environment TU Delft.
- Li, Qirui. 2020. Resilience Thinking as a System Approach to Promote China's Sustainability Transitions. *Sustainability* 12: 5008. [CrossRef]
- Lin, George C. S. 2012. *The Tragedy of the Commons? Urban Land Development in China under Marketization and Globalization*. Working Paper. Edited by Lincoln Institute of Land Policy. Cambridge: Lincoln Institute of Land Policy.
- Liu, Yuting, and Shenjing He. 2010. Chinese Urban Villages as Marginalized Neighbourhoods under Rapid Urbanization. In *Marginalization in Urban China*. Edited by Fulong Wu and Chris Webster. London: Palgrave Macmillan, pp. 177–200.
- Mahzouni, Arian. 2018. Urban brownfield redevelopment and energy transition pathways: A review of planning policies and practices in Freiburg. *Journal of Cleaner Production* 195: 1476–86. [CrossRef]
- McConnell, Virginia, and Keith Wiley. 2010. *Infill Development: Perspectives and Evidence from Economics and Planning*. Discussion Papers. Washington, DC: Resources for the Future.
- Modarress-Sadegui, Mitra, and Tanja Konstari. 2015. *Study on Sustainable City Districts. Good Practices from Ten European Reference Cases*. Edited by City of Turku. Turku: City of Turku, Urban Planning.
- National Bureau of Statistics PRC. 2016. *China City Statistical Yearbook*. Edited by Urban Social and Economic Investigation Department. Beijing: China Statistics Press.
- Nelson, Arthur C., and Thomas W. Sanchez. 2005. The effectiveness of Urban Containment Regimes in Reducing Exurban Sprawl. *disP The Planning Review* 41: 42–47. [CrossRef]
- Nuissl, Henning, and Stefan Siedentop. 2021. Urbanisation and Land Use Change. In *Sustainable Land Management in a European Context*. Edited by Thomas Weith, Tim Barkmann, Nadin Gaasch, Sebastian Rogga, Christian Strauß and Jana Zscheischler. Cham: Springer International Publishing, pp. 75–99.
- Patacchini, Eleonora, and Yves Zenou. 2009. Urban Sprawl in Europe. *Brookings-Wharton Papers on Urban Affairs* 10: 125–49.
- Pichler-Milanovic, Natasa. 2007. European urban sprawl: Sustainability, cultures of (anti) urbanism and "hybrid cityscapes". *Dela* 27: 101–33. [CrossRef]
- Pierce, Joseph, Deborah G Martin, and James T Murphy. 2010. Relational place-making: The networked politics of place. *Transactions of the Institute of British Geographers* 36: 54–70. [CrossRef]
- Proeger, Till, Lukas Meub, and Kilian Bizer. 2018. Tradable development rights under uncertainty: An experimental approach. *Journal of Environmental Economics and Policy* 7. [CrossRef]

- Razin, Eran. 1998. Policies to Control Urban Sprawl: Planning Regulations or Changes in the “Rules of the Game”? *Urban Studies* 35: 321–40. [CrossRef]
- Rubin, Eli. 2009. The Athens Charter. In *Themenportal Europäische Geschichte*. Available online: <https://www.europa.clio-online.de/essay/id/fdae-1486> (accessed on 2 November 2020).
- Schetke, Sophie, Dagmar Haase, and Theo Kötter. 2012. Towards Sustainable Urban Land Use—A Methodological Design for Implementing Social-Ecological Targets into Strategic Planning of Cities in Germany. *Environmental Impact Assessment Review* 32: 195–210. [CrossRef]
- Schiappacasse, Paulina, Bernhard Müller, and Tine-Lise Braekow. 2019. Planned new urban expansion in Europe. The role of technological innovations in enhancing living environments. Paper presented at Between Temptations of Exponential Technology Growth and the Concept of Human City, Belgrade, Serbia, October 24–25.
- Schneider, Annemarie, and Carly M. Mertes. 2014. Expansion and growth in Chinese cities, 1978–2010. *Environmental Research Letters* 9. [CrossRef]
- Schuetze, Thorsten. 2019. Vauban and Rieselfeld, Freiburg, Germany: Innovation in the implementation process. In *Global Planning Innovations for Urban Sustainability*. Edited by Sébastien Darchen and Glen Searle. London: Routledge, pp. 73–89.
- Schulze-Baing, A. 2010. Containing urban sprawl? Comparing brownfield reuse policies in England and Germany. *International Planning Studies* 15: 25–35. [CrossRef]
- Shen, Chunlin, Jing Jin, and Heng-fu Zou. 2012. Fiscal Decentralization in China: History, Impact, Challenges and Next Steps. *Annals of Economics and Finance* 13: 1–51.
- Shepard, Wade. 2015. *Ghost Cities of China*. Edited by Paul French. Asian Arguments. London: Zed Books.
- Siedentop, Stefan, Stefan Fina, and Angelika Krehl. 2016. Greenbelts in Germany’s regional plans. An effective growth management policy? *Landscape and Urban Planning* 145: 71–82. [CrossRef]
- Siegl, Klaus. 2009. *The New District of Freiburg-Rieselfeld: A Case Study of Successful, Sustainable Urban Development*. Edited by Klaus Siegl. Freiburg: Stadt Freiburg.
- Solinger, Dorothy J. 2001. Research Report: Why we cannot count the ‘unemployed’. *The China Quarterly* 167: 671–88. [CrossRef]
- Stan, Angelica I. 2013. Morphological patterns of urban sprawl territories. *Urbanism Architectura Constructii* 4: 11–24.
- TCPA. 2007. *Best Practice in Urban Extensions and New Settlements*. London: Town and Country Planning Association.
- The Scottish Government. 2010. *Delivering Better Places in Scotland. A Guide to Learning from Broader Experience*. Edited by The Scottish Government. Glasgow: University of Glasgow.
- URBED. 2008. *Eco-Towns: Learning from International Experience*. London: PRP, URBED, Design for Homes.
- URBED. 2012. *Study Tour to Dutch New Communities*. London: Urban and Economic Development Ltd.
- van Heijster, Joan. 2020. Imagining Modernization: The Symbolic Embrace of GDP in China. *Chinese Political Science Review* 5: 50–73. [CrossRef]

- Wei, Houkai. 2019. *Urbanization in China. The Path to Harmony and Prosperity*. New York: Springer.
- Wong, Dorcas. 2019. China's City-Tier Classification: How Does It Work? China Briefing. Available online: <https://www.china-briefing.com/news/chinas-city-tier-classification-defined/> (accessed on 3 September 2019).
- World Bank. 2015. *East Asia's Changing Urban Land-Scape. Measuring a Decade of Spatial Growth*. Urban Development Series. Washington, DC: The World Bank.
- World Bank, and DRC. 2014. *Urban China. Toward Efficient, Inclusive, and Sustainable Urbanization*. Washington, DC: The World Bank, Development Research Center of the State Council, P. R. China.
- Wu, Fulong, Jiang Xu, and Anthony G. O. Yeh. 2006. *Urban Development in Post-Reform China: State, Market, and Space*. New York: Routledge.
- Xiao, Yuan, and Jinhua Zhao. 2015. Fixing China's Distorted Urban Land Quota System. In *Paulson Policy Memorandum*. Chicago: Paulson Institute.
- Yeh, Anthony G., and Fulong Fu. 1996. The New Land Development Process and Urban Development in Chinese Cities. *International Journal of Urban and Regional Research* 20. [CrossRef]
- Yeh, Aanthony G. O., Fiona F. Yang, and Jiejing Wang. 2015. Economic transition and urban transformation of China: The interplay of the state and the market. *Urban Studies* 52. [CrossRef]
- Zacharoula, Vasili. 2013. Urban containment policies in European regions. The Case studies of Randstadt and Greater London. Master's Thesis, Nijmegen School of Management, Radboud University Nijmegen, Nijmegen, The Netherlands.
- Zhang, Fangzhu, Calvin Chung, and Zihan Yin. 2019. Green infrastructure for China's new urbanisation: A case study of greenway development in Maanshan. *Urban Studies* 57: 508–24. [CrossRef]
- Zhong, Taiyang, Zhu Qian, Xianjin Huang, Yuntai Zhao, Yan Zhou, and Zehui Zhao. 2018. Impact of the top-down quota-oriented farmland preservation planning on the change of urban land-use intensity in China. *Habitat International* 77: 71–79. [CrossRef]
- Zhuang, Liang, and Chao Ye. 2018. Disorder or Reorder? The Spatial Production of State-Level New Areas in China. *Sustainability* 10: 3628. [CrossRef]

© 2021 by the author. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Land Management for Socially Integrative Cities in Europe

Julia Suering, Andreas Ortner and Alexandra Weitkamp

1. What Are the Challenges Facing Rapidly Growing Cities?

Fast-growing European cities are increasingly confronted with a shortage of usable space. In 2015, almost three-quarters of all Europeans lived in a city. It is projected that the urban population in Europe in cities will increase to around 80% by 2050 (UN United Nations Department of Economic and Social Affairs, Population Division). Due to the increasing concentration of inhabitants in agglomerations, these areas, in particular, have to take different trends into account in their urban development. As a result, more and more cities are facing numerous environmental, economic and social challenges. In addition to various positive aspects of population growth, municipalities are faced with the challenge of insufficient housing, therefore there is a need for urban expansion. Above all, urban development has to deal more and more with social challenges such as (poor) housing conditions, unemployment, poverty and lack of access to certain services (e.g., health care or mobility), segregation and gentrification in urban renewal (Musterd et al. 2017).

In many of these cities, population density has reached a level that poses a threat to both the natural and human environments. The consequences of this are housing shortages and further need for affordable housing. This raises the pressure on public infrastructure. For this reason, urban development should not be left only to the free action of the market. Cities can use various steering instruments for land management. Thereby, the most important challenge is to develop cities in a socially integrative way (for the concept of socially integrative cities cf. Chapter 2).

This chapter gives an overview of land management in urban renewal and urban expansion areas and introduces land management instruments in European agglomerations regarding the promotion of social integrative and sustainable cities. The land management instruments will be systemized into legal instruments, financial instruments and voluntary instruments. Furthermore, this chapter gives an inside view on the implementation of land management instruments in the Netherlands, Germany and France. Finally, the opportunities and limits of land management instruments are presented in a comparative way.

In general, the land management instruments are relevant and applicable for both urban renewal and urban expansion. In this context urban renewal means the development of little used or derelict land, building gaps or resolving land-use conflicts (e.g., interfering with housing and commercial use). Urban expansion refers to the development of arable land to building land, often on the outskirts of cities.

Hereby, the realization of urban aims is important. They differ according to the preconditions: often, the cities want to pass the development cost, mobilize affordable housing or allow the public to participate (Drixler et al. 2014).

The following questions therefore arise:

- How can different land management instruments be systematized?
- Which land management instruments have an impact on social aspects with their implementation?
- Which land management instruments can be recommended for implementation with regard to social integrative and sustainable cities?

2. Methodological Approach

First, a systematization of land management instruments in general is elaborated by a literature review. Furthermore, the application of instruments in the Netherlands, Germany and France are compared in a qualitative way. The literature review provides the above-mentioned introduction to the topic and leads to initial keywords for the systematization and criteria for the analysis.

The systematization is based on a structured literature search. The selection of European countries which are presented are based on a literature search using the snowball principle. The results of the literature review are applied a content analysis. The individual steps are examined in more detail below.

2.1. Approach Systematization

A structured literature search was used for the document review and the subsequent systematization of land management instruments in urban development. The selection of relevant literature was based on keywords for steering instruments for urban expansion and urban renewal areas in the field of land development. Examples of these keywords are “urban development”, “land policy” and steering instruments such as “planning”, “fiscal”, “legal” and “land banking” instruments.

The search results were assessed by criteria and the relevant articles were saved.¹ The quality of the literature was measured with criteria such as objectivity, traceability, validity and whether the literature was scientifically reviewed for the publication process. The relevance was measured by the content regarding the spatial extent of steering measures and the availability of a description of various instruments. Furthermore, the literature includes different steering instruments, their definitions and how they are applied. The literature search was not aimed at the completeness of

¹ Selection of publications according to relevance and scientific quality.

all existing steering instruments but focuses on the most commonly used instruments (frequently mentioned instruments) in Europe.

2.2. Selection of European Countries and Content Analysis

Due to the scope of this chapter, three European countries are examined with regard to their land management instruments and their applications in practice. The selection of the countries is based on the following criteria:

- countries with a similar national understanding of planning;
- countries with similar ownership structures and property registration procedures;
- countries with cities facing social, economic and environmental challenges.

By means of the criteria, the Netherlands, Germany and France were selected for analysis of the application of land management instruments. The literature was subjected to a content analysis using theoretical coding. According to Przyborski and Wohlrab-Sahr (2014) and Flick (2016), theoretical coding is an analysis procedure for data on object-based theory. The aim of coding is to compare phenomena, cases, terms or formulations. The theory is created from a network of categories. In the process, empirical material is assigned selected terms codes, and upper categories. Axial coding was chosen for analysis.² The following categories were selected:

- instrument under study;
- (core) content of the instrument;
- effect in terms of supporting socially inclusive cities;
- stakeholders involved in the planning and implementation process;
- classification in systematization.

3. Land Management in European Countries

Over the years, the narrowly defined discipline of *land policy* has evolved into *land management*. As recently as the 1980s and 1990s, *land policy* was defined and practiced as:

... the name suggests, [it] deals with the resource "land". It involves preparing the land for urban development and other uses that conform to the plan. It helps to ensure that the land is available to users who are suitable from an urban planning point of view. (Güttler 1997, pp. 78–91)

² Axial coding: selection of categories/codes that appear useful for generating theory/answering a question; possibly forming "code families".

As of the 2000s, the discipline was referred to in an international context as land and property management and defined as follows:

Land and property management, as an action-oriented component of spatial development and land policy, encompasses all planning and development processes as well as evaluation and regulatory measures for the use of land and built structures. For this purpose, it uses the necessary legal instruments, economic procedures and engineering methods as well as forms of governance, thus supporting sustainable land use and the functioning of the real estate market at the same time. (Kötter et al. 2015, pp. 137–146)

Both definitions are good examples of the evolution of land management. The second one gives a brief overview of the understanding of land management in the context of this book chapter. It contains the elements and aims of land management.

3.1. Process of Land Development in European Countries

The European countries have experience in the field of land management, in the areas of land banking, land administration and land management systems (including land registration). Even if the systems of the individual countries differ in detail, generally valid statements can still be made (Williamson et al. 2010). The land development process covers a broad spectrum of tasks, from project development, the acquisition or subdivision of land, legal assessment and planning approval and construction work to the allocation of development incentives and costs. Based on planning permissions or land-use permits, the process of land development manages the transformation (e.g., in land use) of existing rural or urban areas and also realizes new building areas (e.g., districts) with new physical infrastructures (Williamson et al. 2010).

The land development process (Figure 1) is divided primarily into three main phases: (1) the initial stage, (2) the land development phase and (3) the phase of mobilization and use.

1. The current land use of the first phase is mostly arable land, which is considered “undeveloped land” from the land management perspective.
2. The focus of the second phase is on the extension of property rights, reallocation and preparation of the development of infrastructure. This is a precondition for plans and permits required for the transformation into building land, for border changes and the preparation of external/internal infrastructures.
3. The third phase involves private investment—i.e., the construction of buildings. The land development process concludes with the consideration of economic developments such as changes in the market and construction quality (e.g., urban land as “built-up land”) (Hendricks et al. 2017).

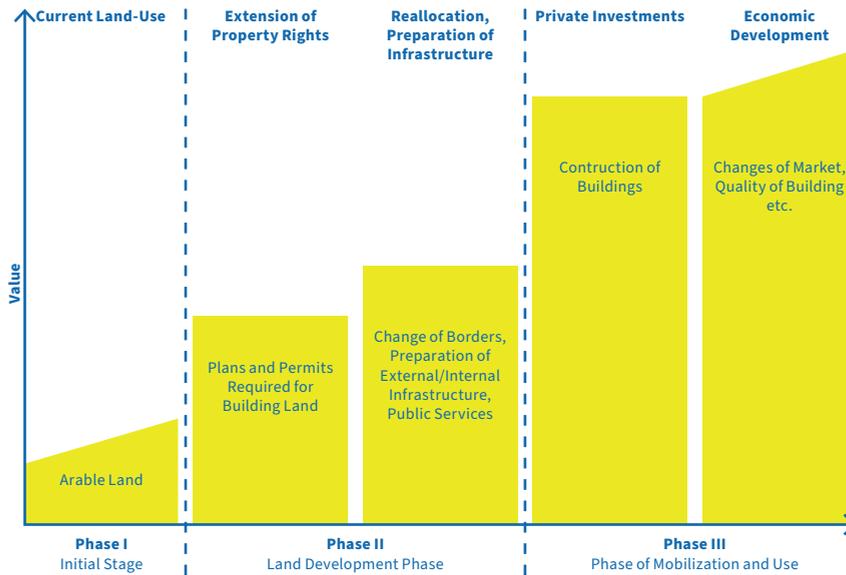


Figure 1. Land development process. Source: extended according to Hendricks et al. (2017), used with permission.

The land development process is usually associated with the change in land use, land tenure and land value. Every step in the development process causes an increase in the land value (realized at purchase prices) and is determined by the (free) market forces (supply and demand).

3.2. Land Management Instruments in Europe

Land management instruments are important for settlement structures and urban development. The systematic use of land management instruments supports the development, order and protection of land as a limited resource. Construction activities for housing, commerce or services and the provision of land for technical infrastructures and public facilities can be controlled.

Each country has its own understanding of land administration and therefore land management instruments are used in different ways. The overarching land management instruments are applied differently in the municipalities of each country, depending on their needs. In this case, land management instruments commonly used throughout the country are considered. The specific application at the municipal level needs to be elaborated in further research.

A comparison of the European country administration systems shows that there is no single European land administration policy (Williamson et al. 2010). Nevertheless, common land management instruments of the land administration systems within European countries can be identified.

Types of Steering Measures in Land Development

From a general land management perspective, land development instruments usable in urban expansion and urban renewal can be categorized as steering measures: (1) voluntary instruments, (2) financial instruments and (3) legal instruments, as presented in Figure 2. Steering refers the possibilities provided—i.e., that the municipalities have to promote social, economic and ecological aspects within their own administrative area.

Voluntary instruments include types of planning instruments, participatory instruments, negotiation and land banking as private interim purchases. Voluntary instruments are all instruments which are optional and not legally binding (Bouwma et al. 2015). Unlike the legal instruments, they rely on free will of the participated parties. The steering possibility of the public is only low—a lot of convincing and negotiating is required.

Public–private partnerships (PPPs) are organized between public and private sectors. The purpose of these is the joint work on urban and regional development functions that none of the partners involved can handle alone and which are of benefit to the partners involved (Schaeffer and Loveridge 2001). There are three kinds of partnerships:

- informal cooperation between local government executives;
- cooperation under contract³;
- quasi-public enterprises (especially in the utility sector) (Schaeffer and Loveridge 2001; Hodge and Greve 2007).

In the negotiation, both parties act on an equal level. A voluntary transaction is a private purchase of land or real estate with both parties on an equal level (private law regulations). Additionally, the municipality has no superior position as in public instruments. Content of the contracts could be also a private land reallocation.

The private interim purchase is an approach of land banking, which is similar to the public interim purchase, with the difference that a private developer buys, develops and sells land of their own free will. Costs, risks and also the profits lie with the developer (Alterman 2012)—often the private interim purchase is combined with a negotiation (urban contract) with the municipality.

³ The most frequent form of public–private partnerships is a cooperative arrangement regulated by a contract.

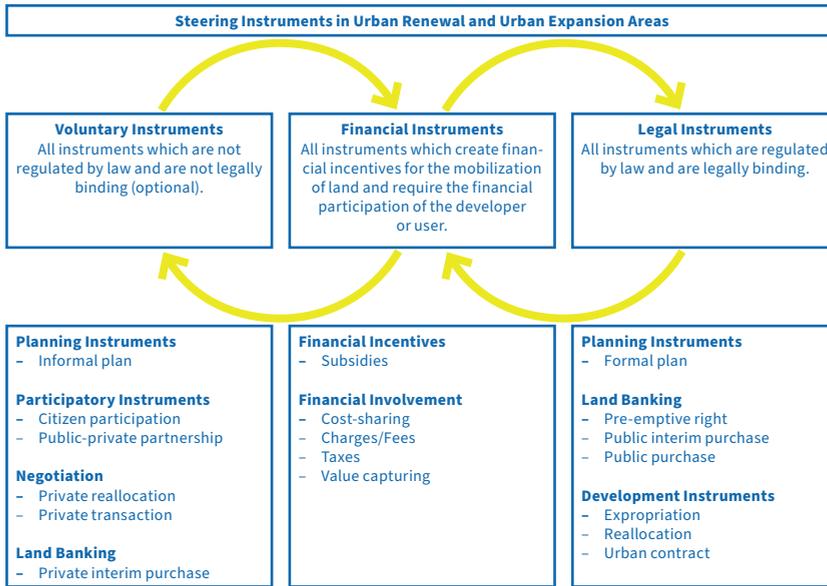


Figure 2. Land development instruments. Source: Graphic by authors.

Financial instruments intervene in the economic balance of development. They include both financial incentives (direct steering—e.g., subsidies) and financial involvement (indirect steering—e.g., cost sharing, charges/fees, and taxes) in costs for urban development stakeholders. Subsidies include the financial support of individual households as well as persons or the financial support for the purchase price of land or the construction of new living space/affordable housing (Europe—e.g., European Social Fund: ESF). The financial support for new living spaces is mostly important for cities with a rise in population and a reduction in the vacancy rate (Silva and Acheampong 2015).

An alternative financial instrument is cost sharing. Responsibility for the provision of the necessary infrastructure (technical infrastructure such as roads and utilities, electricity, water, sewage or public facilities such as playgrounds, kindergartens and schools) lies in general in competence of the municipality, but their production costs can be transferred to a developer. The level of cost sharing is a matter for negotiation and will manifest in an urban contract (see below, legal instrument—contract). In contrast to a private negotiation, the municipality is superior in the process. If a municipality itself develops, they have to pay the costs for initial provision, especially for vehicular and pedestrian infrastructures (roads, paths, squares). The costs can be shifted by charging connection fees to be paid by the owners (Silva and Acheampong 2015). In some countries, the possibility of value capturing is possible for financing the development costs. The raise of value amount can be taken or used to pass on development costs (Hendricks et al. 2017).

Legal instruments are regulated by laws and are legally binding (Silva and Acheampong 2015). Three subgroups can be distinguished: planning instruments, land banking and development instruments.

Formal plans are of the planning instruments type. The function of urban land-use planning is to prepare and manage the structure and the use of land in the municipality (Healey and William 1993; Silva and Acheampong 2015). There can be subdivision in the zoning plan with general regulations (e.g., different land uses such as residential, commercial or industrial) that apply to the whole municipal territory and the binding land-use plan with detailed planning and design for individual parts of the municipal territory (Silva and Acheampong 2015). Regulatory content and liabilities vary in European countries.

Another type of legal instrument is land banking with the subcategories pre-emptive right, public purchase and public interim purchase. The pre-emptive right means that person A and person B conclude a sales contract, whereby persons could also be companies or municipalities. The pre-emptive right allows the municipality to take the place of the buyer. The agreements of the contract continue to apply (Wirth and Wolff 2012; Kaiser et al. 2016). An early and strategic land supply (purchase of land) offers the municipalities scope for action. They are independent and can mobilize and realize the areas according to their goals and ideas. Cities which have tight markets but bought land early on are now profiting from the results. Public interim purchase means that the municipality is first a buyer and then a supplier on the municipal land market. In an early phase, the municipality buys low-cost land, mainly arable land at the edge of the cities, and sells it at a higher price as building land for residential or commercial purposes. Sometimes, the arable land is held for years before a development (Alterman 2012).

One of the development instruments is expropriation, which implies that the removal of property rights by the state is only permissible in the public interest. The land is reused for common goods afterwards. The owner receives monetary compensation, but it can also be paid to another plot of land in an equivalent location. The instrument is strictly regulated (ECHR European Convention on Human Rights; Council for the Environment and Infrastructure 2017). The (public) reallocation means the redistribution of land intends to create land that is suitable for buildings or other uses in terms of location, shape and size. This procedure aims to reorganize or extend certain areas of both developed and undeveloped lands (Council for the Environment and Infrastructure 2017).

The last category in this topic is the urban contract. It is an agreement between the municipality and third parties that include preparation and implementation of urban development measures or other agreements. The municipality is superior and can use its planning right to negotiate the contents of the contract. However, the municipality is influenced by competition and high investment sums, so that it may

not exploit this balance of power for economic reasons. An important part of the urban contract is the height of transferable costs from the municipality to a developer. Signing the contract is a precondition for the development of a plot (Hendricks et al. 2017).

3.3. Good-Practice Examples from Europe

In the following subsections, information of the instruments is provided (voluntary, financial and legal). The conclusion highlights their relevance in terms of supporting socially integrative cities. Here, the focus lies on legal instruments in combination with other sets of common instruments, since they provide the most direct opportunities for steering the implementation of urban development.

3.3.1. The Netherlands

In the Netherlands, there are four practices for developing land. A distinction is made between the acquisition or nonacquisition of land by the municipality and whether negotiations take place with other stakeholders. In the following, only the Active Land Policy approach with contractual negotiations will be described (Fischer and Foisßner 2002; Tennekes 2018). These negotiated land-use plans (instrument under study) are a frequently used instrument for the development of cities (Tennekes 2018). In order to counteract increased land prices, development costs and speculation of land, this planning approach was established as a new land management strategy in the Netherlands in the 1990s (Tennekes 2018).

(Core) Content of the Instrument

As private developers increasingly own land in potential development areas (land speculation in the 1990s; land often without the right to build), it had become impossible for the municipality to acquire the land at a reasonable price for building development (Tennekes 2018). The negotiated land-use plans between the municipality and private developers combine several individual land management instruments into one overall measure and are based on the principle of public-private partnerships. The obvious instruments are: (urban) contracts, formal plans as well as public interim purchase. Under the contract, the municipality can agree on different items with the developers, which can spatially vary.

There are basically two approaches of development:

- **Building claim model:** Private landowners and municipalities negotiate the sale and price of the land. The municipality develops the land, manages the land and reallocates the land according to future land-use claims. The divided land is re-purchased by the contracting parties at the previously negotiated price (Tennekes 2018).

- Joint venture model: Private landowners and the municipality establish a development company together under private law that bundles and develops the land. The company (public–private partnership) can then sell the land to others or develop the property itself (Tennekes 2018).

Effect in Terms of Supporting Socially Inclusive Cities

The Dutch approach of interim purchase of land for development leads to urban development tailored to the goals and needs of the municipality. Based on urban calculations, the municipality can negotiate reasonable prices for the land. The money raised from the sale of the land can be used to cover the costs of public facilities and technical infrastructure and (affordable) housing. This procedure is transparent and uniform for all contractual partners, which in turn increases acceptance among developers. The revenue enables the municipalities to establish needs-based services (e.g., primary and secondary schools, social housing), which can contribute to the satisfaction of the population living there.

The municipality can thus actively guide urban development and integrate social aspects in urban renewal and urban expansion areas. In addition, the municipality can specifically prevent urban sprawl and maintain the security and order of the areas. Since the municipality takes over all development measures itself and has an overview of all development steps, this can lead to an accelerated planning process.

Stakeholders Involved in the Planning and Implementation Process

The main stakeholders in the Dutch urban development process are primarily the municipality and private developers or corporations (Tennekes 2018; Holtslag-Broekhof et al. 2018). The development-led approach, i.e., that land-use plans are drawn up through negotiations on a project-by-project basis, encourages early and close cooperation between the stakeholders in urban development. Other stakeholders are citizens who can be formally or voluntarily involved in different steps of the planning process. The voluntary participation of citizens is at the discretion of the municipality. The involvement of citizens has both potentials (co-decision, acceptance) and risks (longer time for voting, good management in coordinating the management). There may exist tensions between effectiveness and citizen participation and other democratic values. Especially in the joint venture model, municipalities have a double role—as government actors protecting the public good and as private actors invested in the venture. Demanding additional social investments may put the municipality at (financial) risk. It provides opportunities for socially integrative development, but also poses risk due to these roles.

Classification in Systematization

Negotiated land-use plans consist of several land management instruments. These are legal instruments (formal planning and development instruments as well as land banking). However, negotiated land-use plans as an overall measure take into account the project-based planning approach in the Netherlands and support socially inclusive cities as a part of the negotiated content.

Interim Conclusion Regarding Negotiated Land-Use Plans

This instrument is probably more suitable for urban expansion areas. However, its use in urban renewal areas is not excluded. The instrument especially attracts attention because of the close cooperation with private developers. The public-private partnerships enabled the municipality to cover the costs of and provide public services and social housing. As a result of discussions and negotiations with the landowners, the municipality is able to implement the city-wide goals.

3.3.2. Germany

In the German context, the focus is also on legal instruments to support socially integrative cities: one example of steering an intended development process is the so-called building land strategy (instrument under study).

(Core) Content of the Instrument

Using the tool of a basic decision (of the municipality), the municipality can commit itself to manage a social, environmental and/or economic orientation.⁴ With the basic decision, the municipality already sets a future direction for the entire municipal territory. The basic decision is legally binding for the municipality. Building land strategies are basic decisions that combine the possible elements of an urban contract. Building land strategies create various benefits for municipalities and developers, such as the mobilization and conversion of building land potential and the acceleration of land development processes and the basic decision to ensure sustainable land use.

⁴ Objectives of municipal building land strategies are: Social, economic and urban planning objectives. Social Objectives: Improvement of housing supply through housing funding quota and housing construction quota. Economic objectives: Discounted sale of real estate; transfer of costs to developers. Urban planning objectives: Quality objectives of urban development such as building culture, urban development standards and environmental standards.

Effect in Terms of Supporting Socially Inclusive Cities

Building land strategies promotes qualified urban land use, as well as sustainable land use. The municipality chooses their core criteria in a municipal resolution which is binding and afterwards negotiated in each urban contract (e.g., a special portion of affordable housing, green aspects). These strategies offer the mobilization and conversion of building land and the acceleration of processes. The application of building land strategies allows the municipality to partially transfer the financial effort of mobilization to investors (Weitkamp et al. 2017). This, in turn, leads to a reduction in the burden on the municipal budget. Due to the contractual agreement (urban contract) and transparency in the development process, the investor also benefits from the timely use of construction rights. The cost burden for investors is usually capped and depends on an increase in the land value of the respective area to be developed (Suering and Weitkamp 2019). An advantage of building land strategies is the fixation of a transparent and uniform strategy instead of individual case decisions of urban development contracts. Furthermore, they offer fast and secure implementation of the projects, transparency and uniformity.

The investor gives his basic agreement, and subsequently the negotiations for the cost transfer take place. The contract is concluded between the municipality and the investor. After signing the contract, projects are interpreted by the public and the citizens participate. After the participation has taken place, a land-use plan is established and the investor can implement his construction project.

Stakeholders Involved in the Planning and Implementation Process

The investor and the municipality are primarily involved in the actual development process. Other stakeholders in a development process can be landowners, developers, financial institutions, planning and building authorities, building contractors, professional advisers and third parties. The actual basic decision and development project can be preceded by citizen participation (meetings) or informal plans. Through these preceding measures, the acceptance and satisfaction can be increased (Williamson et al. 2010; Jeschke and Weitkamp 2017).

Classification in Systematization

Thus, a building land strategy is a mix of legal and financial instruments (Suering and Weitkamp 2019).

Interim Conclusion Regarding the Building Land Strategies

The social integration in building land strategies can be realized by focusing on social objectives. Instead of making far-reaching economic demands, the municipality can focus on, e.g., social housing (Adolphs et al. 2019; Weitkamp et al. 2020). To this

extent, it uses its room for negotiation to achieve socially integrative goals. With the transfer of obligations to the private sector, the (economic) advantage does not exclusively remain with the investor. Structures that serve the common good are created based on the realization of social and technical infrastructures, housing promotion and climate aspects.

3.3.3. France

In France, too, there are different instruments to support social aspects in land development. The application depends on the respective requirements and needs of the region or municipality. Therefore, not all instruments are applied equally everywhere. With a focus on social aspects (mainly social housing), there is the procedure of land banking (instrument under study), particularly selling land to housing companies in France (Cahier Pratique Documents 2014; Hendricks et al. 2017). The basis for this procedure is the strategic development policy “politique de la ville” and different laws on solidarity and urban renewal. A national authority for urban renewal is established to monitor and steer construction measures. This authority becomes a new central element of the “politique de la ville” (Bauhardt 2005; Glasze and Weber 2010).

(Core) Content of the Instrument

Until the 1970s, many social housing estates were built on the outskirts of cities. After that, the existing stock was considered sufficient and the focus was on subsidies in the form of housing subsidies rather than on promoting the construction of new housing. Over the years, many of the social housing estates have been neglected, with many requiring redevelopment or demolition (Glasze and Weber 2010; Reiter 2011). The need for social housing is very high again today. Therefore, the land banking procedure in the urban development process focuses on social housing.

Traditionally, local authorities sell their land to housing developers. This is to ensure the provision of affordable rental housing development. When developing land, the predefined themes and objectives of the region and municipality must be taken into account.

Effect in Terms of Supporting Socially Inclusive Cities

The right to housing is established in French law. The purpose of construction, planning, allocation and operation of social rental housing is to give people with low incomes access to affordable housing. This should lead to an improvement in housing conditions and a social mix in cities and neighbourhoods (Glasze and Weber 2010).

Apart from simply providing people with housing, there are numerous other effects. Some of them are described in more detail.

The land banking approach in France works against the rise in prices for real estate and land, which has been observed for several years. Further, it counteracts advancing urban sprawl. Urban sprawl often has a direct effect on infrastructure. By stopping urban sprawl, costs for infrastructure facilities can be saved at the same time. Thus, good land policy and land management can counteract the effects mentioned above. In addition, the municipality is to provide social (or adequate) housing in the long term. Land reserves in public hands, which are developed according to demand, can prevent price speculation by private developers.

Stakeholders Involved in the Planning and Implementation Process

The main stakeholders in this process are the local authorities and housing developers. The municipalities sell their land to the companies. After receiving the land, the housing companies are responsible for building social housing. Social housing in France is regulated by a strong involvement of the public sector (Cahier Pratique Documents 2014; Hendricks et al. 2017). The construction of new social housing depends, on the one hand, on the municipality itself as the planning authority, and on the other hand on the possibilities (e.g., financial possibilities) of the housing companies.

Classification in Systematization

The French example also involves a mix of legal and financial instruments to provide the population with social (or adequate) housing. Traditionally, municipalities buy land and resell it to social housing companies.

Interim Conclusion Regarding Land Banking

The construction of social housing to provide affordable housing for the population is heavily dependent on municipalities and housing companies. For many years, the need for social housing was covered, which led to the instrument being pushed into the background of planning. Nowadays, old strategies need to be focussed on and new strategies need to be developed to meet the increasing demand for affordable housing. In this way, the social integration of people in French cities can be successful.

3.4. Comparative Consideration of Good Practice Examples from Europe

In European countries, land management instruments are used at different stages in a development process—mostly in the first two stages of the development process, as in the three examples of the Netherlands, Germany and France. The aim of the instruments is to steer towards a sustainable land use; this can include a change of the type of usage. The most common type of urban development in Europe is a

developer-led development (Hepperle et al. 2017; Gerber et al. 2018). For a developer model, two scenarios exist.

Scenario 1 (expansion or renewal): The land is owned by a developer. There is a gap between actual land use and intended land use. According to the law, the developer is only obliged to build on the gap in such a way that the type and degree of the development fit in with the surrounding buildings. The municipality does not influence the use of the area or the possibility of demanding the realization of affordable housing. If the gap raises, a land-use plan is needed for development. In this case, instruments such as a building land strategy (Germany) or negotiated land-use plans (the Netherlands) could be used.

Scenario 2 (classical expansion): The land is owned by a developer. It is arable land without building rights or greater innercity areas with land-use plans or with former uses such as, e.g., industrial use. The developer wants to develop the land into a new quarter. For this purpose, the owner needs a land-use plan to acquire a building permit. Scenario 2 describes the most common one in Europe. Especially in this scenario, the applicability of the described legally and financing instruments from the Netherlands, Germany and France can mean an added value for the support of socially integrative cities.

However, the city normally tries to combine the preparation of the land-use plan with negotiating (urban contract in Germany or negotiated land-use plan in the Netherlands) preconditions such as taking over all development costs (including public ones) or realizing affordable housing. To this extent, an urban contract can be deployed for different purposes and urban aims—e.g., preparation of infrastructure, permit agreements, reallocation contracts or realization of affordable housing—and the social integrity can be realized in the negotiation process. If the developer does not agree, there will be no planning process needed for permission. Thus, the municipality is able to use its planning right to force special conditions on the developer.

The same effect can be seen using the public interim purchase (land banking in France to promote social housing). There, the city is free to define condition for reselling their own land. However, unlike urban contracts, the city and not a developer bears the complete financial risk. It takes a financially strong city or strategic land banking to be able to carry out an interim purchase at a large scale. However, it offers the greatest steering opportunity for cities. Social integration can be carried out without hindrances within the financial frame of the municipal budget.

4. Conclusions and Outlook

Many European cities are confronted with the challenges of the rapid, sustainable and demand-oriented provision of space for the supply of people. Planning processes and land management instruments are necessary so that cities can be developed in

an orderly and structured manner. Cities are aware of the versatile instruments for activating or restructuring land. The main challenge is the sensible application and combination of different instruments for socially integrative cities.

The land development process proceeds as described in Figure 1. Steering measures are carried out in the first and second phases—the Initial and Land Development Phases—of the development process. In the third phase, processes of urban development are finished. The mentioned land management instruments do not have the same scope and potential for steering socially integrative urban development. Even though the municipalities have knowledge of the legal framework, the challenge posed is the combination of the instruments to achieve a sustainable outcome.

The possibilities to influence land development through steering measures are immense. Every land development instrument offers certain advantages, but also has its limitations. In general, there are a lot of instruments to steer a social integrative city. It is up to the city if it wants to make a conscious choice of which instrument or instruments to apply to a situation. A social integrative development also depends on whether the municipality has to weigh up certain issues against other equally important urban planning issues. Here, a social integrative development may be pushed into the background or will be part of a compromise decision (as shown in the case of the negotiated land-use plan in the Netherlands). The instruments for it exist and can also be used very purposefully (support of legal instruments through financing strategies), as the cases of the Netherlands, Germany and France illustrate. Moreover, these can also be used in a very targeted manner (support for legal instruments through financing strategies).

Land management instruments (e.g., negotiations or interim purchase) are a good example of land development through their steering possibilities. The municipality decides on their aims, e.g., social integration, for the development of the land. Municipality and developer have to negotiate the detailed conditions while the municipality can act freely on their own land in terms of interim purchase (as shown in the cases of the negotiated land-use plan in the Netherlands and the building land strategies in Germany).

The land management strategies in the selected countries all include:

- creating uniform structures;
- creating transparency;
- transferring responsibility to the developer (cost sharing and rapid implementation);
- creating technical infrastructures and public facilities;
- realizing social integrity.

The general findings show that land management instruments are advantageous when supporting socially integrative urban expansion and renewal. To what extent this can happen depends on the individual context (case-by-case decision in the individual area). Thus, the general assessment provides the potentials of individual instruments, and needs reflect regarding broader practice experiences depending on specific projects.

The identified land management instruments support socially integrative matters. The combination of informal instruments (integrated urban development concepts, renewal concepts) and formal instruments (zoning plan or binding land-use plan, as shown in the three case studies) allow strategic and incremental development as well as legally binding steering.

Socially integrative urban development focuses on managing urban expansion, promoting urban density, regenerating existing urban areas and fostering dynamic communities. Strategies for managing sustainable land use must take into account the individual framework conditions for land ownership and land management systems. Land management must play a key role in the transition to urban sustainability through socially integrative cities, because its instruments are able to steer the defined urban aims—e.g., urban contracts, land-use plans (as shown in the Netherlands and Germany) or land banking (as shown in France). Different instruments are needed because of the different initial conditions in urban expansion or urban renewal—combinations of instruments allow a target-oriented development process. The social needs of each city are highly individual and the range of instruments is very diverse. Since not every instrument is equally suitable for all challenges in cities, a detailed choice of usable instruments is required.

If the city intends to develop in a sustainable manner, it shall integrate social aspects in renewal and expansion areas. Economically operating cities should be recommended to carry out demand analyses, move away from supply planning and specifically address their individual needs. This will lead to higher benefits, which could be used for realizing urban aims. This can be supported and implemented by different land management instruments. Therefore, land management instruments allow steering a social integrative process in different stages of the development process and different preconditions. Cities are recommended to use the portfolio of instruments on a case-by-case basis to enable sustainable development.

Author Contributions: J.S.: Conceptualization, Methodology, Analysis, Investigation, Validation, Writing—original draft, Visualization, Writing—review & editing. A.O.: Conceptualization, Writing—original draft, Supervision, Visualization, Writing—review & editing. A.W.: Conceptualization, Writing—original draft, Supervision, Visualization, Writing—review & editing.

Funding: This research was funded by the European Union’s Horizon 2020 Research and Innovation Programme under Grant Agreement No. 770141.

Conflicts of Interest: The authors declare no conflict of interest.

References

- Adolphs, Isabelle, Julia Süring, and Alexandra Weitkamp. 2019. Steigender Wohnungsdruck in deutschen Großstädten: Der Blick über den Tellerrand—Können wir von Wien lernen? *FuB—Flächenmanagement und Bodenordnung* 4: 170–75.
- Alterman, Rachele. 2012. Land-Use Regulations and Property Values: The “Windfalls Capture” Idea Revisited. In *The Oxford Handbook of Urban Economics and Planning*. Edited by Nancy Brooks, Kieran Donaghy and Gerrit-Jan Knaap. Oxford: Oxford University Press, pp. 755–86. [CrossRef]
- Bauhardt, Christine. 2005. Die politique de la ville in Frankreich: Ein Blick auf mehr als zwanzig Jahre Soziale Stadtentwicklung. In *Praxis ohne Theorie?* Edited by Sylvia Greiffenhagen and Katja Neller. Wiesbaden: VS Verlag für Sozialwissenschaften. [CrossRef]
- Bouwma, Irene, Alwin Gerritsen, Dana Kamphorst, and Fred Kistenkas. 2015. *Policy Instruments and Modes of Governance in Environmental Policies of the European Union: Past, Present and Future*. WOT-Technical Report; No. 60. Wageningen: Statutory Research Tasks Unit for Nature and the Environment (WOT Natur and Milieu).
- Cahier Pratique Documents. 2014. Guide a l’Useage des élus Locaux. Le Logement Social et les Politiques Locales de l’Habitat. Available online: https://medias.amf.asso.fr/docs/DOCUMENTS/AMF_10133_GUIDE.pdf (accessed on 20 January 2021).
- Council for the Environment and Infrastructure. 2017. Land Policy in Other Countries: Examples and Inspiration. Available online: https://en.rli.nl/sites/default/files/rli_2017-02_land_for_development_part_2-chptr_4.pdf (accessed on 20 January 2021).
- Drixler, Erwin, Frank Friesecke, Theo Kötter, Alexandra Weitkamp, and Dominik Weiß. 2014. Kommunale Bodenpolitik und Baulandmodelle—Strategien für bezahlbaren Wohnraum? Eine vergleichende Analyse in deutschen Städten. *Schriftenreihe des DVW* 76: 48.
- ECHR (European Convention on Human Rights). 1952. Protocol to the Convention for the Protection of Human Rights and Fundamental Freedoms. Available online: https://www.echr.coe.int/Documents/Convention_ENG.pdf (accessed on 20 January 2021).
- Fischer, Robert, and Peter Foißner. 2002. Raumplanung, Stadtentwicklung und Städtebau in den Niederlanden. *STANDORT—Zeitschrift für Angewandte Geographie* 4: 153–58. [CrossRef]
- Flick, Uwe. 2016. *Qualitative Sozialforschung. Eine Einführung*. Hamburg: Rowohlt Taschenbuch Verlag.
- Gerber, Jean David, Thomas Hartmann, and Andreas Hengstermann. 2018. *Instruments of Land Policy. Dealing with Scarcity of Land*. London and New York: Routledge.
- Glasze, Georg, and Florian Weber. 2010. Drei Jahrzehnte area-basierte Stadtpolitik in Frankreich: Die politique de la ville. Bearbeitung gesellschaftlicher Probleme mittels raumorientierter Ansätze? *Raumforschung und Raumordnung* 6: 459–70. [CrossRef]

- Güttler, Helmut. 1997. Marktverhalten, Bodenpreisbildung, Planung, qualitative Faktoren, Instrumente der Bodenpolitik. In *Boden—Wem nutzt er? Wen stützt er? Neue Perspektiven des Bodenrechts*. Edited by Beate Dieterich and Hartmut Dieterich. Braunschweig: Vieweg & Sohn Verlagsgesellschaft, pp. 78–91.
- Healey, Patsy, and Richard William. 1993. European Urban Planning Systems: Diversity and Convergence. *Urban Studies* 30: 701–20. Available online: <https://journals.sagepub.com/doi/pdf/10.1080/00420989320081881> (accessed on 20 January 2021). [CrossRef]
- Hendricks, Andreas, Thomas Kalbro, Marie Llorente, Thierry Vilmin, and Alexandra Weitkamp. 2017. Public Value Capture of Increasing Property Values. In *Land Ownership and Land Use Development. The Integration of Past, Present, and Future in Spatial Planning and Land Management Policies*. Edited by Erwin Hepperle, Thomas Kalbro, Robert W. Dixon-Gough, Jenny Paulsson, Reinfried Mansberger and Józef Hernik. Zürich: Vdf Hochschulverlag, pp. 257–81.
- Hepperle, Erwin, Robert Dixon-Gough, Reinfried Mansberger, Jenny Paulsson, Jozef Hernik, and Thomas Kalbro, eds. 2017. *Land Ownership and Land Use Development. The Integration of Past, Present, and Future in Spatial Planning and Land Management Policies*. Zürich: Vdf Hochschulverlag AG an der ETH Zürich.
- Hodge, Graeme, and Carsten Greve. 2007. Public-Private Partnerships: An International Performance Review. *Public Administration Review* 67: 545–58. [CrossRef]
- Holtslag-Broekhof, Sanne, Thomas Hartmann, and Tejo Spit. 2018. Compulsory acquisition in the Netherlands. In *Compulsory Property Acquisition for Urban Densification*. Edited by Glen Searle. London: Routledge, pp. 8–17.
- Kaiser, Nathalie, Sophie Rudolf, Jan Berli, Anna Hersperger, Felix Kienast, and Tobias Schulz. 2016. *Raumplanung in Schweizer Gemeinden: Ergebnisse einer Umfrage*. Birmensdorf: WSL Berichte, Heft 42.
- Kötter, Theo, Luz Berend, Andreas Drees, Sebastian Kropp, Hans Joachim Linke, Axel Lorig, Franz Reuter, Karl-Heinz Thiemann, Winrich Voß, and Alexandra Weitkamp. 2015. Land- und Immobilienmanagement—Begriffe, Handlungsfelder und Strategien. *Zeitschrift für Geodäsie, Geoinformation und Landmanagement* 140: 136–46. [CrossRef]
- Jeschke, Anja, and Alexandra Weitkamp. 2017. Stakeholders' Behaviour and Interaction in Context of Land Use. In *Land Ownership and Land Use Development. The Integration of Past, Present, and Future in Spatial Planning and Land Management Policies*. Edited by Erwin Hepperle, Thomas Kalbro, Robert W. Dixon-Gough, Jenny Paulsson, Reinfried Mansberger and Józef Hernik. Zürich: Vdf Hochschulverlag, pp. 119–30.
- Musterd, Sako, Szymon Marcińczak, Maarten van Ham, and Tiit Tammaru. 2017. Socioeconomic segregation in European capital cities. Increasing separation between poor and rich. *Urban Geography* 38: 1062–83. [CrossRef]
- Przyborski, Aglaja, and Moniks Wohlrab-Sahr. 2014. *Qualitative Sozialforschung. Ein Arbeitsbuch*. München: Oldenbourg Wissenschaftsverlag GmbH.
- Reiter, Renate. 2011. *Politiktransfer der EU. Die Europäisierung der Stadtpolitik in Deutschland und Frankreich*. Forschungen zur Europäischen Integration. Wiesbaden: VS Verlag für Sozialwissenschaften.

- Schaeffer, Peter, and Scott Loveridge. 2001. Towards an Understanding of Types of Public-Private Cooperation. *Public Performance & Management Review* 26: 169–89. [CrossRef]
- Silva, Elisabete, and Ransford Acheampong. 2015. *Developing an Inventory and Typology of Land-use Planning Systems and Policy Instruments in OECD Countries*. OECD Environment Working Papers. Paris: OECD. [CrossRef]
- Suering, Julia, and Alexandra Weitkamp. 2019. Erfolgsfaktoren von Baulandmodellen—Unterschiede und Gemeinsamkeiten der Lösungsansätze. *FuB—Flächenmanagement und Bodenordnung* 3: 134–41.
- Tennekes, Joost. 2018. Negotiated Land Use Plans in the Netherlands. A Central Instrument in Dutch ‘active’ and ‘passive’ Land Policy. In *Instruments of Land Policy. Dealing with Scarcity of Land*. Edited by Andreas Hengstermann, Thomas Hartmann and Jean-David Gerber. London and New York: Routledge.
- UN (United Nations Department of Economic and Social Affairs, Population Division). 2019. *World Urbanization Prospects: The 2018 Revision (ST/ESA/SER.A/420)*. New York: United Nations.
- Weitkamp, Alexandra, Isabelle Klein, and Frank Friesecke. 2017. Strategies of Developing Building Land in Growing Cities. In *Land Ownership and Land Use Development. The Integration of Past, Present, and Future in Spatial Planning and Land Management Policies*. Edited by Erwin Hepperle, Thomas Kalbro, Robert W. Dixon-Gough, Jenny Paulsson, Reinfried Mansberger and Józef Hernik. Zürich: Vdf Hochschulverlag, pp. 327–40.
- Weitkamp, Alexandra, Isabelle Adolphs, Anja Jahn, Annette Lombard, Bastian Sell, and Torben Stefani. 2020. Baulandmodelle—Flexibilisierungsmöglichkeiten zur Anpassung an städtebauliche Herausforderungen. *AVN* 127: 281–89.
- Williamson, Ian, Stig Enemark, Jude Wallace, and Abbas Rajabifard. 2010. *Land Administration for Sustainable Development*. Redlands: ESRP Press Academic.
- Wirth, Axel, and Nina Wolff. 2012. *Öffentliches Baurecht praxisnah. Basiswissen mit Fallbeispielen*. Wiesbaden: Springer Vieweg, Available online: <https://link.springer.com/content/pdf/10.1007%2F978-3-8348-8639-2.pdf> (accessed on 20 January 2021).

© 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Socially Integrative Urban Regeneration

Towards Socially Integrative Urban Regeneration—Comparative Perspectives from China and Europe

Stefanie Roessler, Jianming Cai, Jing Lin and Mengfan Jiang

1. Introduction

Reflecting the growing urbanization rates in light of global sustainability development goals (SDGs), the increasing land take for settlement processes, the increasing need for natural resources for building activities and infrastructure provision, the growing inequality and spatial disparities call for a re-think of urbanization strategies. The regeneration of existing, but maybe deprived, urban stock seems crucial in order to limit consumption of land and resources by parallel strengthening social cohesion and equal opportunities for urban inhabitants overall, ensuring economic strengths and competitiveness of cities (Zheng et al. 2014). Consequently, urban regeneration is a central strategy of sustainable urban development in both China and Europe (EU Ministers Responsible for Urban Matters 2016; Central Committee of the Communist Party of China 2020).

Collectively, the nations of Europe can look back on a long history in urban renewal or, as it is often called, urban regeneration. Historically, urban development has undergone a process of renewal in the wake of fundamental economic transitions. In this article, we only refer to modern approaches that arose after the economic restructuring of 1970/1980 as well as the reaction to the growing awareness of environmental challenges and social inequalities in cities. In particular, many European Union (EU) and national policies/programmes have been introduced in support of urban regeneration, whether through strategies or funding, along with discussions about sustainable urban development. In China, we can observe a large variety of approaches to urban renewal and urban regeneration, addressing the respective political goals, city strategies and societal challenges of the individual periods and different stages of urban development but also the competing roles of stakeholders in urban renewal and urban regeneration (Yi et al. 2020; Wang 2020); yet, as in Europe, China is currently striving to ensure a form of urban development that is socially integrative.

Due to the longstanding tradition of urban regeneration in both China and Europe, it could be valuable to exchange ideas and manifold experiences in order to learn from each other, to up-scale good practices, but also to raise awareness for fundamental differences and limits of replication. This article aims to take stock of

urban regeneration pathways and frameworks in Europe and China in a comparative way as a basis to reflect challenges of socially integrative urban regeneration.^{1,2}

In Section 2, the terms and definitions of urban regeneration in Europe and China as well as the drivers and the various modes of regeneration found in practice are discussed. The specific challenges of urban regeneration in China and Europe are discussed in Section 3 from the perspective of social integration. Finally, some conclusions for future efforts of urban regeneration both in China and Europe are drawn in Section 4.

2. Taking Stock: Urban Regeneration and Renewal in Europe and China

2.1. Terms and Definitions

In both China and Europe, a range of terms is used to describe the concept of urban renewal: “Urban renewal, urban regeneration, urban redevelopment, and urban rehabilitation share similar meanings, but are used in different countries or regions” (Zheng et al. 2014). While these terms are certainly comparable, they can also be seen as highlighting different aspects of urban renewal: “Urban regeneration comes by a variety of names, including ‘urban renewal’, ‘urban refurbishment’ and ‘urban retrofit’ and can take many forms” (URBACT 2014). Thus, although the various terms have a similar basic meaning, there may be some variation in the extent, scale and scope of application (Zheng et al. 2014).

In the European context, the most common terms are urban renewal and urban regeneration, which may be used synonymously (Couch et al. 2011). However, renewal more explicitly addresses physical aspects, while regeneration is associated with “a comprehensive and integrated vision and action to resolve the multi-faceted problems of urban areas and to improve the economic, physical, social and environmental conditions” (Ercan 2011). In order to link the spatial/physical/building/infrastructure perspectives of urban renewal with social and economic aspects, EU bodies commonly use the term urban regeneration in their documents (URBACT 2014). Nevertheless, different approaches of renewal and regeneration share a comprehensive and integrative perspective, including on governance (Colantonio and Dixon 2009). Regarding sustainability, notions to environmental aspects to regeneration can also be identified: “[...] we understand

¹ The chapter is a result of a research and innovation action funded from the European Union’s Horizon 2020 Research and Innovation Programme under grant agreement no. 770141. Contents are based on parts of a report that was submitted by the authors after the first year of the project as a deliverable project (TRANS-URBAN-EU-CHINA 2019b). This chapter refers to Sections 2.1.2, 2.2.3 and 3.1 of the report, which were exclusively elaborated and written by the authors.

² For the conceptual background of socially integrative cities, see Chapter 2 in this book and (TRANS-URBAN-EU-CHINA 2019a).

sustainable urban regeneration as regeneration policies and processes within a city which seek to address interrelated problems in order to consider, reduce and mitigate their environmental impact” (URBACT 2014). Although there seems to be a common understanding of regeneration, the different origins and initiating drivers behind this concept need to be understood and reflected on: “The definition of the ‘urban’ being ‘regenerated’ and, indeed, the understanding of ‘regeneration’ have varied according to the initiative being pursued, even if this has rarely been acknowledged by those making or implementing the policies” (Cochrane 2007).

The terms and definitions of urban renewal in China are different from those in Europe. The scientific definition of various concepts related to this process is still evolving and under discussion. In particular, although the term urban renewal has been directly borrowed from the European context (translated in Chinese as *cheng shi geng xin*), it is understood in several different ways. Employed generically, the term urban renewal was firstly introduced by Wu (Wu 1999) together with urban regeneration, urban redevelopment, rehabilitation and conservation. Table 1 summarizes the various interpretations and practices of urban redevelopment, urban rehabilitation and urban renewal in China. While these three terms refer to similar practices, there are differences in the historical background, scale, time, drivers and objectives.

In summary, urban regeneration and urban renewal are the most widely used terms and approaches in China and the EU (see Figure 1). While related terms, such as urban redevelopment, urban reconstruction, reuse, urban rehabilitation and conservation can be found, these can be understood as particular forms of urban renewal, addressing different scopes and scales (see Figure 1).

Table 1. Terms and their meaning in China. Source: Table by authors, first published in TRANS-URBAN-EU-CHINA (2019b, p. 23).

<i>Description</i>	Jiu Cheng (Old City) Zheng Zhi	Jiu Cheng (Old City) Gai Zao	Cheng Shi (City) Geng Xin
<i>Corresponding English term</i>	Urban rehabilitation	Urban redevelopment	Urban renewal (regeneration)
<i>Rationale related to European context</i>	In China, the old city refers to urban built-up areas before the foundation of the PRC. Thus, Zheng Zhi means rehabilitation but also implies management	Gai Zao means to fundamentally change the old things into new things, adapt to the new circumstances and needs	Geng Xin expand the target to both old and new cities. This is like a metabolism system which imperceptibly replaces the old with the new.
<i>First use in China</i>	In the 1950s, soon after the foundation of the PRC	In the 1980s, following the country's reform and opening up	In 1992, after a seminar on urban renewal in Beijing
<i>Scale</i>	Small-scale, specific targets	Large-scale, wide-ranging	Large-scale, generally with multi-objectives
<i>Historical background</i>	Post-war recovery, limited resources, political decisions to fully use the existed urban assets to build new cities	Rapid economic growth and urban development, increasing land values, former city functions needed adjusting, services and quality of life needed upgrading	A decline in urban centres, rising unemployment, economic depression, deteriorating social security and living conditions
<i>Drivers</i>	Policy-led social improvement	Economic-oriented and socio-oriented processes	Mixed and comprehensive orientation
<i>Main target</i>	To modify and reuse existing buildings and infrastructure in old cities in order to improve the living standards of local residents.	To redevelop the old city, based on urban planning adapted to the new economic situation by exploiting the advantage of old cities' location to attract fresh development. In practice, ushered in large-scale demolition, reconstruction and relocation.	To revitalize the city centre and urban nodes, thereby boosting the urban economy; to stabilize society and encourage the middle- and upper-middle class to return to formerly run-down urban areas.

In the following, the term urban regeneration is used to refer to the overall approach.

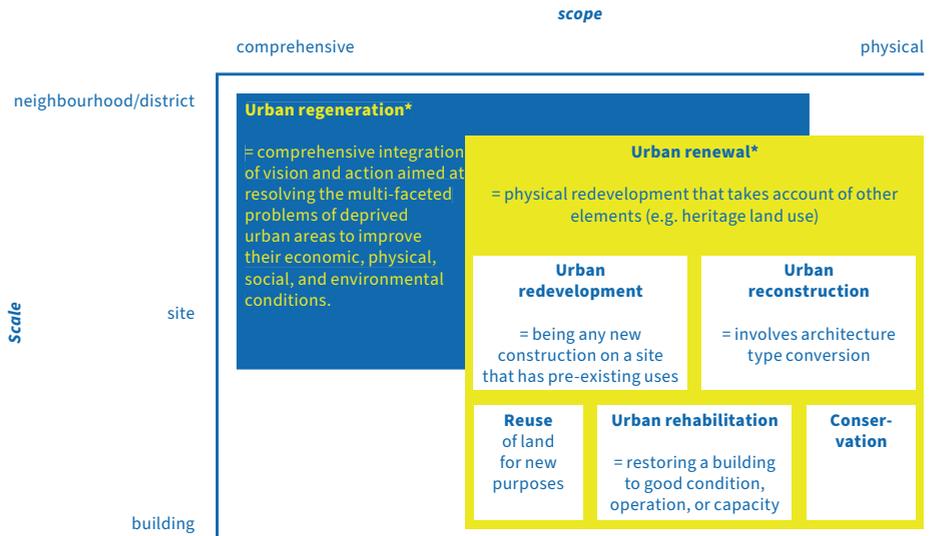


Figure 1. Terms and definitions. Source: Graphic by authors, first published in TRANS-URBAN-EU-CHINA (2019b, p. 22), after (Colantonio and Dixon 2009; Couch et al. 2011; Wu 1999; Xue et al. 2015; Zheng et al. 2014). *Some authors/sources do not differentiate these two approaches.

2.2. Drivers of Urban Regeneration

Urban regeneration is influenced by several drivers, which can be classified by various categories or dimensions (see Figure 2).

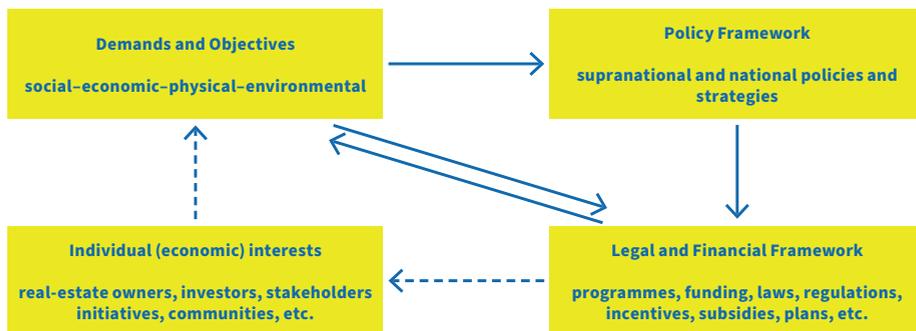


Figure 2. Framework of drivers for processes of urban regeneration. Source: Graphic by authors, first published in TRANS-URBAN-EU-CHINA (2019b, p. 29).

2.2.1. Demands and Objectives of Urban Regeneration

A wide variety of demands and objectives can be linked to the need for regeneration. In Figure 3, the main demands, categorized as economic, social,

physical and environmental, to be addressed by regeneration activities are shown.³ There are also some cross-cutting and overall issues to be addressed, for example, social disparities or the unbalanced development of cities.

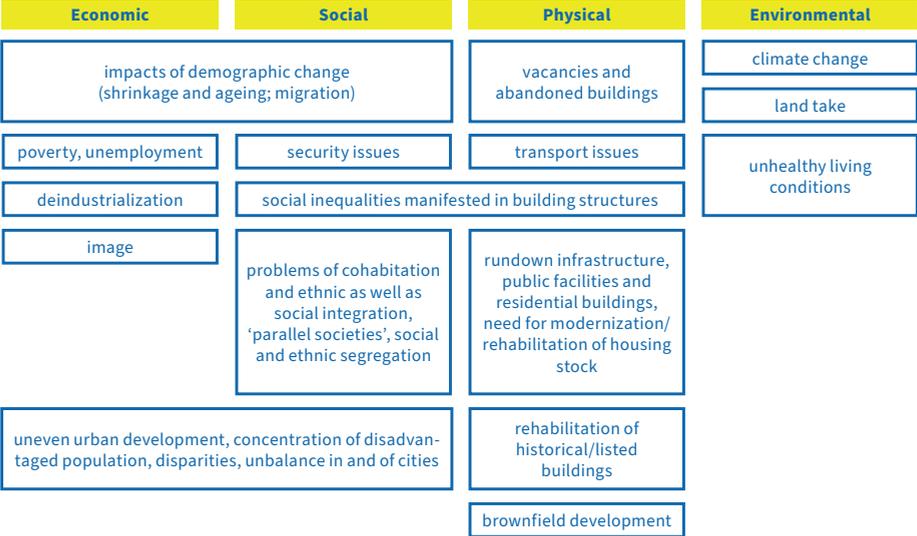


Figure 3. Overview of local demands which might be addressed by urban regeneration. Source: Graphic by authors, first published in TRANS-URBAN-EU-CHINA (2019b, p. 27).

For Europe, the following objectives of urban renewal activities can be identified: To improve living conditions, foster sustainable development and pursue strategies of growth, achieve economic stabilization and finally create not only competitive cities in a globalized world but those that can serve as engines of growth. From a dedicated urban perspective, the factors underlying the adoption of urban regeneration policies and projects include “pressures from major short- or long-term economic problems, deindustrialisation, demographic changes, underinvestment, infrastructural obsolescence, structural or cyclical employment issues, political disenfranchisement, racial or social tensions, physical deterioration, and physical changes to urban areas” (URBACT 2014, p. 6). In regard to environmentally sustainable urban regeneration in European cities today, three thematic clusters of challenges have been identified (URBACT 2014): The physical perspective encompasses climate change, carbon emissions and resource use; the socio-economic perspective highlights social justice, inequality and health, also related to ageing,

³ Physical demands also cover the issue of the preservation and rehabilitation of architectural heritage. This issue is addressed in detail in Section 2 of the book.

diversification, socio-spatial segregation and socio-economic inequalities; finally, the geo-institutional perspective deals with issues of governance and geographical disparities (climatic, institutional, historical, etc.). “In the last three decades urban renewal policies have grown in complexity due to the multi-dimensional character of urban problems such as deteriorating housing quality, poverty, unemployment, social exclusion, segregation, low quality of public space, etc.” (Kleinhans 2004).

The original motivation for urban regeneration in China was to replace and upgrade ageing urban infrastructure, for example, by demolishing dilapidated buildings and improving living conditions through better public facilities. Today, urban regeneration is driven by China’s profound social and economic changes as well as the population’s increasingly sophisticated demands on infrastructure (Xue et al. 2015). In this regeneration process, the Chinese government is dealing with five related demands, namely, (1) deindustrialization and tertiarization in large industrialized cities; (2) suburbanization and gentrification in central cities; (3) the development of urban communities and the provision of jobs; (4) the protection and maintenance of the country’s cultural (physical) heritage; (5) institutional reforms of urban planning and management (Zhang 2004a).

2.2.2. Urban Regeneration Policy Framework

On the one hand, the policy framework is influenced by local demands and the level of societal awareness. On the other hand, global debates and general trends (above all, sustainability) are reflected and transferred into national or supra-national goals. Following the evolution of various general and dedicated urban policies, in terms of strategy papers, funding programmes and initiatives is summarized to represent the political framework of urban regeneration activities.

From around 1990, European urban policies have been continuously developed to complement already established national strategies, programmes and approaches. These have set the normative framework for urban regeneration, while also supporting pilot projects and concrete approaches by providing funding and additional incentives in terms of networks and awards. Figure 4 gives an overview of the main European policies and programmes that explicitly address urban regeneration (TRANS-URBAN-EU-CHINA 2019b).

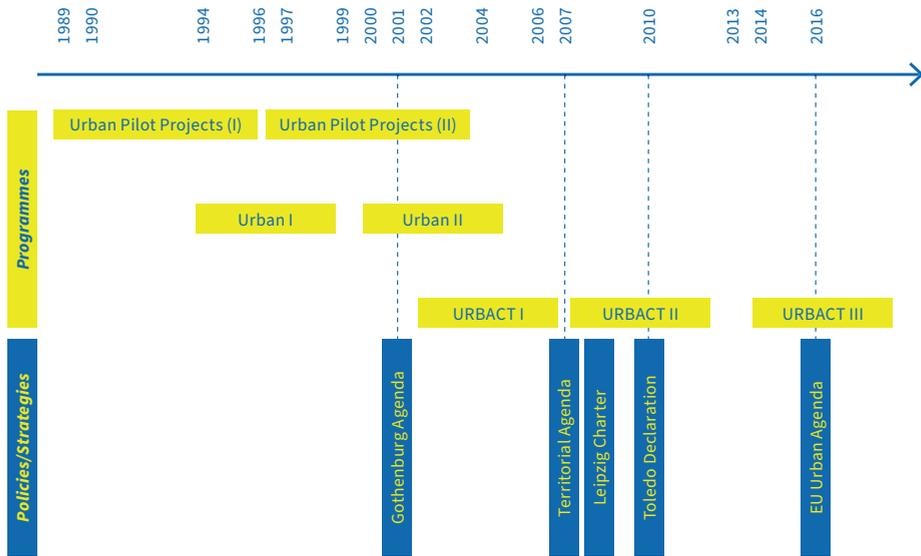


Figure 4. Overview of European policies, strategies and programmes. Source: Graphic by authors, first published in TRANS-URBAN-EU-CHINA (2019b, p. 7).

Launched in 1989, the Urban Pilot Projects funded small-scale actions to support innovation in urban regeneration, thereby fostering economic and social cohesion in the old EU member states. Experiences gained with these Urban Pilot Projects were subsequently consolidated in the specific (funding) programmes URBAN I and II. These took an integrated approach to tackling the prevalence of social, environmental and economic problems in extremely deprived neighbourhoods, which suffer from high unemployment, poor housing conditions, a run-down urban fabric, a lack of social amenities as well as the isolation, poverty and social exclusion of local residents. The funding measures supported projects that combined the upgrading of infrastructure and housing with economic and employment measures, complemented by activities to combat social exclusion and improve environmental quality. Three major areas of intervention were pursued to achieve social and economic regeneration: physical and environmental regeneration, the fight against social exclusion and the promotion of enterprise and employment.

In 2002, the URBACT programme was established as part of the URBAN II community initiative to support exchange and learning activities in and between cities that were active in URBAN I and II as well as in Urban Pilot Projects. It introduced local support groups and local action plans along with a strengthened approach to capacity building and capitalization. URBACT was run in three phases: 2002–2006, 2007–2013 and 2014–2020. With the Leipzig Charter on Sustainable European Cities of 2007, the focus of European urban policies turned to deprived neighbourhoods in order to boost social cohesion and integration. The Toledo Declaration of 2010

highlighted the strategic role of integrated urban regeneration in the future of urban development, in particular by addressing different perspectives, namely, the environmental perspective; the social perspective; urban planning, architectural and cultural viewpoints; and finally, the governance perspective. This approach also aims to optimize, preserve or revalue existing urban capital (i.e., social capital, the built environment and physical heritage) in contrast to other forms of intervention that only prioritize the value of land.

Currently, there is no explicit EU funding programme for concrete urban renewal projects. Nevertheless, urban issues are covered by the European Regional Development Funds (ERDF) and realized through INTERREG-programmes⁴; the Urban Innovative Actions; European research programmes as well as specific programmes, such as LIFE, which is the EU's financial instrument supporting environmental, nature conservation and climate action projects. In terms of the mainstreaming of urban issues through structural funds (ERDF), this means that national states are required to define their own urban priorities (European Urban Knowledge Network (EUKN 2011)).

In addition to the EU framework for urban regeneration, different pathways and also "path dependencies" must be considered within national states (Couch et al. 2011). "The content and implementation of urban renewal policies differs greatly between countries, depending on, for example, the welfare system and political forces as well as physical, social and economic structures of urban areas. There are, however, also similarities [orientation to the housing stock of urban residential areas, great importance to housing diversification and social mix in neighbourhoods] between national renewal policies" (Kleinmans 2004). The individual urban regeneration policies have developed at different speeds and taken different trajectories (Couch et al. 2011). For example, some states with a long history of urban regeneration, for example, the UK and Germany, have influenced the course of European policy. On the other hand, the newer member states of Eastern Europe, for example, Poland, only started their urban regeneration activities around 2000, so that their approaches are strongly shaped by existing EU urban policies and programmes.

For more than three decades, China has experienced breakneck urbanization, i.e., expanding settlement areas and urban populations. At the same time, many historic urban areas have suffered in this period from a poorly maintained physical environment and infrastructure as well as declining industrial or commercial bases and, consequently, a loosening of social networks. In danger of losing essential amenities and thus their level of attractiveness, most cities, particular the large cities

⁴ INTERREG is a set of programmes to stimulate cooperation between regions in the European Union. Introduced in 1989, it is funded by the European Regional Development Fund (www.interregeurope.eu).

that were encouraged to be transferred from consumptive cities into productive ones in the socialism planning period, were becoming socially isolated and economically distressed within the wider process of dynamic urbanization (e.g., cities in the northeast provinces Liaoning, Jilin and Heilongjiang, being the country's largest declining areas since the 1980s). To address these issues, China began implementing its pilot urban renewal projects in the early 1990s. In the initial stages, however, when tracts of public housing (built and managed then mainly by state owned enterprises) and the less competitive industrial sites, both in economic performance and urban life with dull physical environment, were crying out for sensitive urban redevelopment, these projects largely took the form of the widespread demolition of workers villages/communities buildings in urban industry areas or historic neighbourhoods in downtown areas, with inhabitants relocated to distant locations either to new industrial zones or urban fringe residential areas (Hui 2013).

The main Chinese policy strands on urban renewal are shown in Figure 5. It should be noted that many of these policies and programmes were originally initiated by either provincial or city governments (TRANS-URBAN-EU-CHINA 2019b).

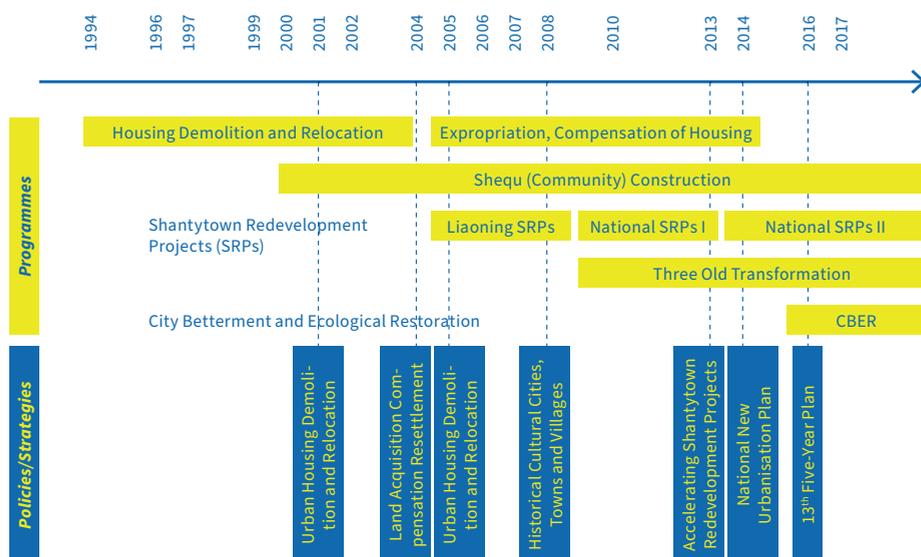


Figure 5. Overview of urban policies and programmes to foster urban renewal in China. Source: Graphic by authors, first published in TRANS-URBAN-EU-CHINA (2019b, p. 17).

The first local directive regulating the expropriation and removal of housing on state-owned land was the Ningbo collectively-owned land requisitioned house demolition for urban construction administrative methods of 1996 (URBAN

ZHEJIANG 2003; Xu 2006). In 2004, the State Council of the People's Republic of China (PRC) issued its decision on deepening reform and strict land management control. This document merely established the framework for reforming land acquisition practices without providing operational details. In November 2004, the Ministry of Land Resources issued an Instructive Opinion on improving the system of land acquisition compensation and resettlement, offering further guidelines for implementing the requirements of the previous decision (Chan 2006). In order to cope with the legislative demands posed by the new situation, China's State Council made amendments to the Administrative Regulations on Urban Housing Demolition and Relocation (State Council 2011). This was seen as providing the main legal basis for expropriation and compensation. Finally, in January 2011, the State Council promulgated its Regulations on Expropriation and Compensation of Housing on State-owned land (Jun and Haiting 2011).

In 2005, Liaoning Province launched its Shantytown Redevelopment Project (SRP, Peng-hu-qu Gaizao) (LNJST 2008).⁵ In 2008, in parallel with residential redevelopment projects by local governments, the central government initiated the first round of national SRPs. The aim was to improve the living conditions of low-income residents and to stimulate the depressed housing market. In 2013, the central government triggered a second round of SRPs aimed particularly at improving the living conditions of vulnerable residents in undesirable small-scale urban areas. Meanwhile, the State Council published the first national-level policy "Several opinions on accelerating shantytown redevelopment projects" (State Council of the People's Republic of China 2013).

In 1999, under the National shequ (neighbourhood community) construction experimentation work realization plan, the Ministry of Civil Affairs (MCA) chose 26 urban districts that had built a tested infrastructural foundation for community services to be pilots for shequ construction.⁶ In 2000, the Central Committee and State Council endorsed the first formal document concerning shequ construction,⁷

⁵ In China, the term shantytown (*peng-hu-qu*) is widely used in government policies. It refers to dilapidated housing or illegally constructed shanties in historic inner cities, business zones or rundown villages in (sub)urban and rural areas (Li et al. 2018).

⁶ An administrative area under the jurisdiction of a residents' committee is referred to as a *shequ* or "neighbourhood community". The *shequ* policy obeys the principle that residents' committees can and should play an important role in urban governance, in particular to help resolve the unprecedented social challenges accompanying the country's transition to a market economy (Shieh 2011).

⁷ *Shequ* construction is more than a form of grassroots governance to replace the former *Danwei* and guarantee local self-management and self-organization, it also concerns the large-scale development of gated housing communities. *Shequ* construction is "a national movement launched by the PRC government to resolve growing social problems in shequ level", to build "a service network and operational mechanism whose primary goal is to satisfy residents' various social service needs", and to create "a new local governance system" to reduce the pressures on the local government (Tang and Sun 2017).

the Memorandum from the Ministry of Civil Affairs on promoting urban shequ construction throughout the nation. Two years later, the MCA selected 27 cities and 148 districts from the national programme as demonstration sites for shequ construction (Kojima and Kokubun 2002).

The initiative Redevelopment of the Three Old (*san jiu gai zao*),⁸ which ran from 2010 to 2015, aimed to shape early practices by increasing urban land values. This was achieved by protecting the property and redevelopment rights and heritages of the original residents (Wang 2016).

The code of conservation planning for historic cities, issued in 2005, strives to protect the historic appearance and spatial layout of cities. In particular, the planning of historical urban area protection should serve to improve the living conditions of local residents and maintain the vitality of communities (Wang 2012). According to the Regulation for protecting historical urban areas issued by the Ministry of Construction and State Administration of Cultural Heritage, measures should be taken to protect the authenticity, integrity and functional continuity of historic urban areas. Moreover, the government should play a leading role in improving the local infrastructure and living environment, with the participation of the local residents (Wang 2012).

In 2016, China promoted “Chengshi Shuangxiu” (literally: “urban weaving/networking and rehabilitation”, but more generally translated by China Daily as “city betterment”, CBER) as well as ecological restoration programmes on a nationwide scale to “accelerate transformation of urban development to ensure quality upgrades and sustainability” (Ma 2016). To this end, 58 pilot cities were selected by various provinces to conduct the three-stage “city betterment” programme (Ministry of Housing and Urban–Rural Development (MOHURD 2017).

2.2.3. Legal and Financial Framework

In order to implement policies and strategies, a set of public steering approaches is required to set the legal framework and provide financial support.

In the European context, basic steering approaches are provided and developed from the general EU (see Section on “Policy framework”) and national policy frameworks while taking account of the particular challenges to be addressed in relevant neighbourhoods. The identified policy objectives are implemented by means of programmes, funding measures, legal regulations, etc., which empower local stakeholders, offer incentives to real-estate owners and investors to act in the affected neighbourhoods as well as trigger state-funded measures to regenerate

⁸ The expression “three old”, first introduced in Guangzhou in 2008, refers to “the old town, the old village and the old factory” (Guangzhou Municipal People’s Government 2009).

public spaces or infrastructure. Funding can come from different arenas and scales: European (co-)funding programmes, national funding and on occasion additional regional/federal funding programmes. To ensure that implementation is aligned with other private, societal and general aims of urban development, the individual national states issued a set of legal regulations, e.g., within the national building code. In this way, private and public interests are safeguarded as well as fair and balanced regeneration activities. A legal framework and funding pathways, integrated urban development concepts, masterplans or similar concepts are developed in order to coordinate urban regeneration issues and to prepare and implement the regeneration activities (Aalbers and Van Beckhoven 2010).

In the Chinese context, there are three major implementation approaches employed by the central government to promote urban renewal: (1) establishing pilot models for nationwide replication; (2) building up a system of awards and incentives to encourage local governments to obey proposed standards and criteria; and (3) the promotion of general/comprehensive objectives, which can, however, be achieved through different local approaches (Zhang et al. 2018). This mechanism can be described as “from decentralized experimentation to centrally imposed model emulation”, combined with “ad hoc central interference” (Heilmann 2008). Due to “the devolution of power to local bodies”, local governments always take responsibility for comprehensive land development as well as individual projects under these three approaches (Acharya 2005). They can promulgate supplementary local regulations and rules in order to implement policy objectives. Regarding the funding of urban regeneration projects, the principle is that those parts intended for commercial use shall be financed by the market, whereas those belonging to the state shall be publicly funded.

2.2.4. Individual (Economic) Interests

The actual implementation of urban regeneration is dictated by the individual (economic) interests of different stakeholders, which also influence possible partnership modes (Zheng et al. 2014). Local residents, stakeholder initiatives and communities formulate their specific demands, objectives and expectations for urban regeneration. Real-estate owners (some of whom are local residents) and potential investors have particular interests, which may in fact be primarily economic interests. These interests can be addressed by tailoring the legal and financial framework to empower and enable single stakeholders to act while ensuring that individual economic interests are nonetheless subordinated to community interests.

In Europe, the building stock and land are mainly owned by private people or housing companies or associations (Schmid et al. 2005). Urban regeneration, therefore, only can be realized by considering and addressing their (economic) interests (Cruz and de Brito 2015). While the refurbishment of buildings might be supported

by state funding programmes, such as direct financing, tax relief or professional advice, the main effort has to be taken by the individual owners pursuing their own economic interest, i.e., to avoid vacancies and extract rent (Cruz and de Brito 2015). The inflation in rents following upgrading activities can lead to the process of gentrification, whereby the original residents can no longer meet rental payments and are replaced by wealthier tenants (Breckner 2010; Bailey and Robertson 1997). Various instruments, such as rent controls or mandatory proportions of social housing in designated districts are employed to avoid this (Altes 2016). In contrast, the refurbishment of public spaces, streets, green spaces and infrastructural facilities, which are mainly owned and managed by the municipalities, is usually publicly financed through municipal or national budgets or indeed EU co-funding programmes. Some attempts are made by municipalities to claw back part of the financial benefits enjoyed by private owners from public improvement measures in their neighbourhoods. Due to the huge efforts of the public sector, regeneration processes are steered and planned by municipal authorities, supported by legal regulations and funding schemes. As regeneration cannot be implemented without private investment or the acceptance and support of local stakeholders, upgrading measures are carefully discussed and planned with affected communities in each city case by case (TRANS-URBAN-EU-CHINA 2019a). In fact, regeneration projects and processes can be initiated by either local residents or local authorities. Yet the implementation is usually a joint process, primarily led by the government (Zheng et al. 2014). The governance pattern of urban regeneration is strongly influenced by the relationship between central and local governments as well as the degree of “top-down” or “bottom-up” control (Couch et al. 2011).

Various models are applied in China for the implementation of urban regeneration (see Figure 6). While government-led urban regeneration is still dominant in most cities, in some large metropolitan areas, such as Beijing, Shanghai, Shenzhen and Wuhan, other stakeholders—in particular, major real estate developers—are playing increasingly important roles in urban regeneration. In these property-led models, the involvement of private developers has often sped up urban gentrification due to their demand for a return on investment. This implies that the issue of finance is becoming increasingly central to the general practice of urban regeneration. Popular in the early years of urban regeneration, the comprehensive model is today rather neglected. The main feature of this approach is described as “public-private-community three-way partnership-based, multi-objective-oriented urban regeneration” (Zhang 2004b). The emergence of the “urban village” problem placed a spotlight on the community-oriented model.⁹ In some areas where villagers

⁹ “Urban villages”, a unique phenomenon in China, are former rural settlements under the organization of clan authorities that still retain a certain level of autonomy (Lin et al. 2012). Due to rapid urbanization,

have considerable autonomy (mainly in urban fringe areas by incrementally urban growth or left behind urban areas encroached by fast urban expansion), urban regeneration projects are managed by the village collective with the local government merely providing some policy support and relevant guidance during the process. In contrast to the top-down government-led model, this can be described as bottom-up implementation (Wang 2013). Refining the general approaches and drawing on the practice of urban renewal in Shenzhen, Zhou (2014) identified five different modes to reflect the main actors and characteristics of the implementation. These are (1) the government-led mode with market operation; (2) the developer-led mode with government guidance; (3) the village autonomy-led mode; (4) the comprehensive improvement mode with government investment, market operation and residents' participation; and (5) the coordination mode of the whole village and community, which is government-led and community based.

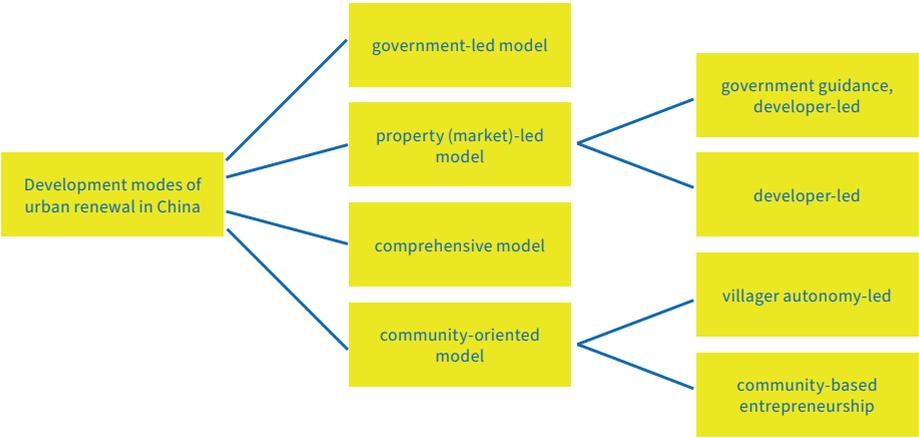


Figure 6. Urban renewal in China classified by development mode. Source: Graphic by authors.

3. Challenges of Socially Integrative Urban Regeneration in China and Europe

Social inclusion has become a focus of the urban regeneration debate, in particular, issues of community involvement and public participation (Zheng et al. 2014). Undoubtedly, the efforts and successes of urban regeneration both in Europe and China need to be acknowledged. However, reflecting their results against the objective of fostering socially integrative urban regeneration, some differentiated perspectives must be considered.

they have been swallowed up by nearby settlements. Today, urban villages are found on both the outskirts and central areas of major Chinese cities and are administered by the village collective (Zeng 2016).

3.1. Challenges of Socially Integrative Urban Regeneration in Europe

Although a number of similarities can be observed across the European states, the disparate contexts, political preferences and policy conventions lead to different approaches and forms of urban renewal (Couch et al. 2011). The context is strongly influenced by patterns of urbanization, housing types, tenure types as well as forms of governance, defined by the administrative system and institutional structures (ibid.). While recognizing these differences, some common challenges for socially integrative urban renewal can be observed: nearly all urban regeneration strategies and approaches in Europe aim to address the relevant features of a “socially integrative city”. At the same time, not all of the initial objectives can be reached. In particular, the following challenges need to be highlighted:

Lack of Involvement of Local Communities

Research on Central and Eastern European countries (CEECs) has revealed important territorial disparities to Western European states. In particular, there is still poor involvement of local communities in regeneration projects. It has also been found that “the regeneration projects in post-communist cities are not resolved comprehensively, i.e., that the structures, which are subject to regeneration, are addressed individually with weak relation to community needs and to the surrounding areas of a city” (Hlaváček et al. 2016). Unfortunately, there is still little awareness of the vital links between regeneration interventions, group processes and community-based identification (Heath et al. 2017).

Approaches in which “culture is seen as the main catalyst and engine of the regeneration” (Ferilli et al. 2017), termed culture-led urban transformation, can be essential to the revival of post-industrial urban areas. If culture is directly addressed in a programme of regeneration, this will have the effect of “renewing the image of the city and of its neighbourhoods, fostering the pride and sense of belonging of residents, attracting investments and tourism, improving the quality of life and social cohesion, creating new jobs in the cultural and creative sectors” (Ferilli et al. 2017). Yet, it is unclear to what extent this will impact issues of “social empowerment, social cohesion and capability building” (Ferilli et al. 2017) as crucial objectives of urban regeneration.

Risks of Gentrification

Successful regeneration that brings economic growth and improved living conditions often results in the gentrification and displacement of economically weak persons (Larsen and Hansen 2008). Although never intended, often state and market interact in a way that causes gentrification. The mechanisms of private property markets together with insufficient deflecting mechanism lead more or less

automatically to the replacement of vulnerable socio-economic groups (Larsen and Hansen 2008).

Barriers for Integrated Approaches

In general, there is a widespread awareness of the necessity and potential of integrated approaches, i.e., those which address both physical and social interventions. This is also stressed by overall strategies and policies. Nevertheless, experiences gained in a number of areas have shown that such integrated approaches can face practical barriers, suggesting that the “term ‘integrated’ is more a policy-‘buzzword’ than a coherent and recognisable practice” (Aalbers and Van Beckhoven 2010).

Private Interests vs. Public Efforts

Despite societal and political awareness of the advantages, potentials and needs of housing rehabilitation, particularly in historic city centres, the framework of liberalized markets to some extent hinders private interventions. Against this background, there is a continuously high need for public interventions to stimulate renewal activities (Cruz and de Brito 2015).

Long-Term Support

A continuous challenge is dealing with the long-term maintenance costs, both for new public facilities as well as for any “soft” measures for capacity building, education, etc. Land management measures and the related funding schemes cover regularly only the financial efforts of land use change, but not the continuous costs of running public infrastructure, public green spaces, etc. (TRANS-URBAN-EU-CHINA 2020).

3.2. Challenges of Socially Integrative Urban Regeneration in China

From the perspective of fostering socially integrative cities (see relevant chapter in this book) and in response to current processes of urbanization, urban regeneration in China faces the following challenges.

Growing Relevance of Urban Regeneration as an Urban Strategy

The economic slow-down in China is raising uncertainty about implementing the planned key infrastructure in old urban areas. Parallely, it is also depressing the number of interprovincial long-distance in-migrants from rural to urban areas (Zhu et al. 2016); this means that existing urban areas must be made more accessible to casual labourers, who generally are new migrants; as a consequence, the demand for urban renewal will rise. In addition, the so-called Millennials and Generation Z prefer to live in a more urban and cosmopolitan environment, further increasing the demand for urban renewal (TRANS-URBAN-EU-CHINA 2019b).

Increasing Costs and Efforts for Relocation

High density, poor environmental conditions, such as a lack of green spaces, rundown and narrow/less roads and inadequate urban facilities (e.g., an antiquated sewage system as well as rubbish storage and collection), in existing historic or downtown neighbourhoods make relocation increasingly difficult. Relocation costs are increasingly on the rise, prohibiting or delaying renewal measures in certain locations. While people-oriented relocation regulations (e.g., a project must be approved by 85 % of local residents in order to proceed) improved public participation, they tend to make urban renewal processes very time consuming (TRANS-URBAN-EU-CHINA 2019b).

Extensive Physical Renewal Demands.

The protection and preservation of cultural heritage in built-up areas could be contradictory to urban functional adjustment. If only a handful of buildings are worth preserving, this could fragment the renewal site and complicate the redevelopment process; it could also discourage private developers. Therefore, creative ways of conservation should be explored on a case by case basis. A less viable local environment and run-down conditions in old buildings in distressed areas make the physical upgrading more difficult and costly, particularly when the aim is to ensure the higher energy efficiency of buildings (TRANS-URBAN-EU-CHINA 2019b).

Ensuring an Efficient and Affordable Urban Transport

Essentially there are no specific policies to realize Transit Oriented Development (TOD) in the urban core; much human energy and time is wasted through poor connections to surrounding areas or buildings. There is little standardization in the practices of public-private partnership, particularly when State-Owned Enterprises (SOEs) assume the role of the private sector; this slows down the provision of much needed transportation infrastructures (Cheng et al. 2016; Cai et al. 2020). High levels of car ownership and limited parking spaces in old neighbourhoods cause dangerous situations when mixed flows of pedestrians, cyclists, courier tri-cyclists and cars utilize narrow streets; the situation is exacerbated by cars parking in narrow alleyways and on sidewalks, etc. Gated communities in most urban cores generate barriers to accessibility and hinder connectivity of the urban fabric.

Ensuring Equal Access to Municipal Services

Most shantytowns and urban villages have poor infrastructure and sub-standard facilities due to their informal status; at the same time, they provide sleeping quarters to vulnerable groups due to the cheap living costs. The Hukou system creates an invisible wall preventing people without a permanent urban residential permit

(mainly rural migrants and young graduates) from accessing municipal services, in particular, schools, affordable housing, healthcare facilities as well as bank loans for housing.

There is a lack of diverse formal education and training systems at the community or neighbourhood scale, while private systems are likely to be prohibitively expensive to most local residents in disadvantaged areas. Although the government encourages communities to strengthen or provide education and training services locally, the high cost of customized education or training is difficult to meet, particularly as neighbourhoods usually do not have their own budget (TRANS-URBAN-EU-CHINA 2019b).

Weakening of Local Economy and Labour Markets

High-end urban redevelopments may lead to the loss of some labour-intensive industrial/manufacturing sectors and enterprises, therefore reducing job opportunities for local residents. Regulations prohibiting any kinds of business in residential apartments prevent the growth of start-ups which emit little pollution or noise. Urban renewal may also eliminate some small local businesses and reduce the diversity of job markets by driving out lower-skilled workers who can no longer afford to live there (TRANS-URBAN-EU-CHINA 2019b).

Lack of Addressing Identity and Social Capital

There is insufficient awareness-raising and participation of multi-stakeholders, along with limited mobilization of additional players and a lack of related events and activities, to advertise/brand the local physical heritage and its multiple values. The place-making movement is relatively new in Chinese cities. In particular, there is lack of awareness and appropriate approaches to integrate local inhabitants in renewal processes. There is a dilemma of pursuing social integration objectives while effectively maintaining the affordability in redeveloped communities (TRANS-URBAN-EU-CHINA 2019b).

4. Conclusions

While urban renewal in China is widespread and frequently large scale, practitioners still suffer from a lack of good reference and experience in practice, although at the national level, China learnt quickly from its own mistakes and lessons as well as from international good practices. The shift in recent decades from the widespread demolition of historic towns and traditional city centres to a more organic approach in urban renewal practice demonstrated that China is gradually recognizing the importance and the historic value of the existing urban fabric. In particular, more attention is being paid to cultural heritage, the effective capitalization of these assets through public participation, awareness raising, smart planning, careful

implementation, clearer regulations and proactive public–private partnerships in infrastructural improvement and urban redevelopment, etc. Nevertheless, there remain new challenges in the coming transitional period, specifically, the high costs of relocation, less desirable redevelopments which lack social inclusiveness as well as ensuring “organic” environmental improvements that can exploit the value of amenities embedded in the living culture to the benefit of redeveloped communities. It is expected that a more socially integrative approach to urban renewal will become common practice in China through the new urbanization pursuit which began in 2014, focusing on quality development for a more liveable and harmonious city. This promising trend is illustrated by various national regulations and local requirements for pilot and demonstration projects in community building and place-making that have been carried out in a number of Chinese cities. However, given the tremendous challenges identified in this article, greater efforts and careful implementation are still needed for exploring and carrying out a clear roadmap guiding urban renewal practice.

Regarding urban regeneration in European cities, there exists a more or less balanced system of both top-down and bottom-up approaches: national states define the main targets while providing funding and drawing up regulations; they are supported by European funding and research programmes; and in parallel, affected municipalities/communities strongly influence the implementation of regeneration measures by helping to choose the particular neighbourhoods for upgrading as well as defining the priority topics and measures to be undertaken. Considering the several European national funding programmes addressing urban renewal in municipalities (for example, “Kvarterløft” in Denmark, “New Deal” in the UK and “Urban Restructuring” in Germany, TRANS-URBAN-EU-CHINA 2020), two main components are found to be crucial. First, funding schemes initiate actions in neighbourhoods where private and public finances are lacking in order to address individual economic interests and socio-economic demands of communities. Second, to regulate the upgrading processes and avoid segregation or displacement, it is vital to draw up accompanying legal regulations for implementation. All recent approaches have shown a great awareness of the role of local communities, inhabitants and other stakeholders to implement successful and, in particular, socially integrative projects in urban renewal. Nevertheless, there remain some basic challenges for the future, specifically, the issue of gentrification and regeneration processes that are lacking in dynamism.

In order to learn from each other, specific frame conditions need to be acknowledged (TRANS-URBAN-EU-CHINA 2020): First, the fundamental difference in land ownership and land administration needs to be named. This has major impacts in urban renewal processes. Second, some differences in national policies, pathways and attitudes towards renewal have to be stated. We see contradictory

perspectives on the instruments of relocation and displacement in urban renewal and their assessment in order to support socially integrative cities. For instance, the issue of gentrification is conceptualised in completely different ways: Chinese renewal uses this in terms of a strategy to attract skilled, high-income residents and competitive businesses. In Europe, it is seen as a negative social by-product of rising housing prices and values of real estate properties in the context of urban renewal which one tries to minimise (Liu et al. 2019). Third, the dynamics in renewal differs between China and Europe, being influenced by overall political and societal goals but also challenges. Thus, testing new instruments in pilot projects is a good practice lesson from China. However, its success is associated with the country size, the political system and the centralised structure: in China, once a project becomes a pilot initiative, it usually can be a successful one, as preferential policies and extra resources will be allocated to the project, including sending supporting experts. Therefore, failure factors could be eliminated in the early stage and in the implementation process. Only successful elements will be summarized as good practice and upscaled in other places.

Author Contributions: Conceptualization: S.R. and J.C. Investigation: S.R., J.C., J.L. and M.J. Writing—Original draft preparation: S.R., J.C., J.L. and M.J. Writing—Review and editing: S.R., J.C., J.L. and M.J.

Funding: This article has been elaborated within the project TRANS-URBAN-EU-CHINA (“Transition towards urban sustainability through socially integrative cities in the EU and in China”), funded by the European Union’s Horizon 2020 Research and Innovation Programme under Grant Agreement No. 770141.

Conflicts of Interest: The authors declare no conflict of interest.

Abbreviations

CBER	City betterment
CEECs	Central and Eastern European countries
ERDF	European Regional Development Funds
EU	European Union
EUKN	European Urban Knowledge Network
INTERREG	key instrument of the EU supporting cooperation across borders through project funding, funded by ERDF
LIFE	EU programme for the environment and climate action
LNJST	Department of Construction of Liaoning Province (China)
MCA	Ministry of Civil Affairs (China)
MOHURD	Ministry of Housing and Urban–Rural Development (China)
PRC	People’s Republic of China
SDGs	Sustainability Development Goals
SRP	Shantytown Redevelopment Project

SRP	Shantytown Redevelopment Project
SOEs	State Owned Enterprises
URBACT	European exchange and learning programme promoting sustainable urban development
URBAN	European Community Initiative for the economic and social regeneration of cities and neighbourhoods in crisis in order to promote sustainable urban development

References

- Aalbers, Manuel B., and Ellen Van Beckhoven. 2010. The integrated approach in neighbourhood renewal: More than just a philosophy? *Tijdschrift voor Economische en Sociale Geografie* 101: 449–61. [CrossRef]
- Acharya, Shrawan Kumar. 2005. Urban development in post-reform China: Insights from Beijing. *Norsk Geografisk Tidsskrift (Norwegian Journal of Geography)* 59: 228–36. [CrossRef]
- Altes, Willem K. Korthals. 2016. Forced relocation and tenancy law in Europe. *Cities* 52: 79–85. [CrossRef]
- Bailey, Nick, and Douglas Robertson. 1997. Housing Renewal, Urban Policy and Gentrification. *Urban Studies* 34: 561–78. [CrossRef]
- Breckner, Ingrid. 2010. Gentrifizierung im 21. Jahrhundert. *ApuZ Aus Politik und Zeitgeschichte* 17: 27–32.
- Cai, Jianming, Jing Lin, Zhenshang Yang, Xinfu Zhou, and Zhe Cheng. 2020. Retro or Renewal: An Assessment of PPP Management and Policy in China Since 2014. *Public Works Management & Policy* 1–22. [CrossRef]
- Central Committee of the Communist Party of China. 2020. *Suggestions on Compilation of the 14th Five Year Plan and 2035 Vision Planning*. Beijing: People's Publishing Press.
- Chan, Nelson. 2006. Recent reform of China's rural land compensation standards. *Pacific Rim Property Research Journal* 12: 3–21. [CrossRef]
- Cheng, Zhe, Yongjia Ke, Jing Lin, Zhensha Yang, and Jianming Cai. 2016. Spatio-temporal dynamics of public private partnership projects in China. *International Journal of Project Management* 34: 1242–51. [CrossRef]
- Cochrane, Allan. 2007. *Understanding Urban Policy: A Critical Approach*. Oxford: Blackwell.
- Colantonio, Andrea, and Tim Dixon. 2009. *Measuring Socially Sustainable Urban Regeneration in Europe*. Report. Oxford: Oxford Brooks University.
- Couch, Chris, Olivier Sykes, and Wolfgang Börstinghaus. 2011. Thirty years of urban regeneration in Britain, Germany and France: The importance of context and path dependency. *Progress in Planning* 75: 1–52. [CrossRef]
- Cruz, Carlos Oliveira, and Jorge de Brito. 2015. Role of Public Administration in Fostering Urban Housing Rehabilitation. *Journal of Urban Planning and Development* 141: 06014002. [CrossRef]
- Ercan, Müge Akkar. 2011. Challenges and conflicts in achieving sustainable communities in historic neighbourhoods of Istanbul. *Habitat International* 35: 295–306. [CrossRef]
- EU Ministers Responsible for Urban Matters. 2016. Establishing the Urban Agenda for the EU 'Pact of Amsterdam'. Available online: https://ec.europa.eu/futurium/en/system/files/ged/pact-of-amsterdam_en.pdf (accessed on 18 November 2019).

- EUKN. 2011. *Urban Development in Europe. A Survey of National Approaches to Urban Policy in 15 EU Member States*. The Hague: European Urban Knowledge Network.
- Ferilli, Guido, Pier Luigi Sacco, Giorgio Tavano Blessi, and Stefano Forbici. 2017. Power to the people: when culture works as a social catalyst in urban regeneration processes (and when it does not). *European Planning Studies* 25: 241–58. [CrossRef]
- Guangzhou Municipal People's Government. 2009. *Guangzhou Municipal People's Government on Promoting the Implementation of the Transformation of the Old City of Guangzhou City*; Guangzhou: Guangzhou Municipal People's Government.
- Heath, Stacey C., Anna Rabinovich, and Manuela Barreto. 2017. Putting identity into the community: Exploring the social dynamics of urban regeneration. *European Journal of Social Psychology* 47: 855–66. [CrossRef]
- Heilmann, Sebastian. 2008. From local experiments to national policy: The origins of China's distinctive policy process. *The China Journal* 59: 1–30. [CrossRef]
- Hlaváček, Petr, Pavel Raška, and Martin Balej. 2016. Regeneration projects in Central and Eastern European post-communist cities: Current trends and community needs. *Habitat International* 56: 31–41. [CrossRef]
- Hui, Xiaoxi. 2013. *Housing, Urban Renewal and Socio-Spatial Integration. A Study on the Rehabilitating the Former Socialist Public Housing Areas in Beijing*. Dissertation thesis, University of Delft, Delft, The Netherlands.
- Jun, Yan, and Chen Haiting. 2011. Understanding the Regulations on Expropriation and Compensation of Housing on State-Owned Land. *China Bulletin*, November 24. Available online: <https://www.chinalawinsight.com/2011/11/articles/real-estate-infrastructure/understanding-the-regulations-on-expropriation-and-compensation-of-housing-on-stateowned-land/> (accessed on 18 November 2019).
- Kleinhans, Reinout. 2004. Social implications of housing diversification in urban renewal: A review of recent literature. *Journal of Housing and the Built Environment* 19: 367–90. [CrossRef]
- Kojima, Kazuko, and Ryosei Kokubun. 2002. The Shequ Construction Programme and the Chinese Communist Party. *The Copenhagen Journal of Asian Studies* 16: 86–105. [CrossRef]
- Larsen, Henrik Gutzo, and Anders Lund Hansen. 2008. Gentrification—Gentle or Traumatic? Urban Renewal Policies and Socioeconomic Transformations in Copenhagen. *Urban Studies* 45: 2429–48. [CrossRef]
- Li, Xin, Reinout Kleinhans, and Maarten van Ham. 2018. Shantytown redevelopment projects: State-led redevelopment of declining neighbourhoods under market transition in Shenyang, China. *Cities* 73: 106–16. [CrossRef]
- Lin, Yanliu, Bruno De Meulder, and Shifu Wangu. 2012. The interplay of state, market and society in the socio-spatial transformation of “villages in the city” in Guangzhou. *Environment and Urbanization* 24: 325–43. [CrossRef]
- Liu, Fengbao, Xigang Zhu, Jianshu Li, Jie Sun, and Qinshi Huang. 2019. Progress of Gentrification Research in China: A Bibliometric Review. *Sustainability* 11: 367. [CrossRef]
- LNJST. 2008. *The Successful Practise of the Scientific Outlook for Development: The Essence of Shanty Town Redevelopment*. Shenyang: Liaoning People's Publishing House.

- Ma, Zhiping. 2016. More Chinese Cities Looking to Increase Betterment Programs. December 11. Available online: http://www.chinadaily.com.cn/china/2016-12/11/content_27635150.htm (accessed on 2 December 2019).
- MOHURD. 2017. Announcement of the Third Round of “City Betterment and Ecological Restoration Programs” Pilot Cities. Urban Planning Society of China, April 24. Available online: <http://www.planning.org.cn/news/view?id=7115> (accessed on 23 September 2018).
- Schmid, Christoph U., Christian Hertel, and Hartmut Wicke. 2005. *Real Property Law and Procedure in the European Union*. Würzburg: Florence.
- Shieh, Leslie. 2011. *Shequ Construction: Policy Implementation, Community Building, and Urban Governance in China*. Vancouver: University of British Columbia.
- State Council. 2011. *Regulation on the Expropriation of Buildings on State-Owned Land and Compensation*. Order No. 590 of the State Council. Available online: <http://www.lawinfochina.com/display.aspx?lib=law&id=8580&CGid=> (accessed on 18 November 2019).
- State Council of the People’s Republic of China. 2013. *Several Opinions on Accelerating Shantytown Redevelopment Projects*. Beijing: State Council of the People’s Republic of China.
- Tang, Ning, and Fei Sun. 2017. Shequ construction and service development in urban China: An examination of the Shenzhen model. *Community Development Journal* 52: 10–20. [CrossRef]
- TRANS-URBAN-EU-CHINA. 2019a. *Theoretical Aspects of Transition Towards Urban Sustainability and the Role of Socially Integrative Cities*. D 6.6 Workshop Report. Available online: http://transurbaneuchina.eu/fileadmin/user_upload/tuec/files/Deliverables/TRANS-URBAN-EU-CHINA_D6.6.pdf (accessed on 15 March 2020).
- TRANS-URBAN-EU-CHINA. 2019b. *Report on the Current Framework and Situation of Urban Renewal, Urban Expansion as Well as Land Management and Land Banking (Incl. Land Administration) in China and Europe*. D 3.1. Available online: http://transurbaneuchina.eu/fileadmin/user_upload/tuec/files/results/TRANS-URBAN-EU-CHINA_D_3.1_IOER_20190113_v_3.0.pdf (accessed on 20 March 2019).
- TRANS-URBAN-EU-CHINA. 2020. *Land Management Instruments for Socially Integrative Urban Expansion and Urban Renewal in China and Europe*. D 3.3. Available online: http://transurbaneuchina.eu/fileadmin/user_upload/tuec/files/Deliverables/TRANS-URBAN-EU-CHINA_D3.3_final_30.06.20.pdf (accessed on 16 November 2020).
- URBACT. 2014. *State of the Art on Sustainable Regeneration in Urban Areas, URBACT II Capitalisation*. Saint Denis: URBACT. Available online: https://urbact.eu/sites/default/files/state_of_the_art_sust_regen.pdf (accessed on 18 November 2019).
- URBAN ZHEJIANG. 2003. *Resettlement Action Plan of Jiangdongnan Sewage Treatment Plant and Related Pipelines Project*. Ningbo City: World Bank Group.
- Wang, Jinghui. 2012. Problems and solutions in the protection of historical urban areas. *Frontiers of Architectural Research* 1: 40–43. [CrossRef]
- Wang, Shifu. 2016. *Challenges and Opportunities of China’s Urban Renewal*. MIT Real Estate Entrepreneurship Lab. Available online: <https://de.slideshare.net/STLLab1/challenges-and-opportunities-of-chinas-urban-renewal> (accessed on 3 November 2019).

- Wang, Xu. 2013. *The Renewal of Urban Village—Problems and Potentials of Hongshan Village*. Nanjing: Karlskrona.
- Wang, Yajie. 2020. Investigations and further thoughts on urban renewal and regeneration in China. *Report in the Annual Meeting on Urban Planning of China Academy of Urban Planning and Design (CAUPD)*. July 14.
- Wu, Liangyong. 1999. *Rehabilitating the Old City of Beijing: A Project in the Ju'er Hutong Neighbourhood*. Vancouver: UBC Press.
- Xu, H. 2006. *Problems Analysis of The Land Expropriation and Housing Removal*. Shanghai: Tongji University.
- Xue, Chunlu, Xinqi Zheng, Bo Zhang, and Zhiyuan Yuan. 2015. Evolution of a multidimensional architectural landscape under urban regeneration: A case study of Jinan, China. *Ecological Indicators* 55: 12–22. [CrossRef]
- Yi, Chengdong, Dan Han, and Chunzhi Yang. 2020. Beijing Urban Regeneration for 70 years: History and Models. *China Real Estate* 4: 38–45. [CrossRef]
- Zeng, Zhipeng. 2016. An Analysis of Power Relations in the Redevelopment of Urban Villages-Three Case Studies in Guangzhou, China. Master's thesis, Columbia University, New York, NY, USA.
- Zhang, Geng Li. 2004a. Towards three-way partnership in urban regeneration: The Western experience and implications to Chinese cities. *Urban Development Studies* 4: 26–32.
- Zhang, Pingyu. 2004b. Urban regeneration: China Urbanization Trends in 21st Century. *Progress in Geography* 23: 72–79.
- Zhang, Qui, Esther Hiu Kwan Yung, and Edwin H. W. Chan. 2018. Towards Sustainable Neighborhoods: Challenges and Opportunities for Neighborhood Planning in Transitional Urban China. *Sustainability* 10: 406. [CrossRef]
- Zheng, Helen Wei, Geoffrey Qiping Shen, and Hao Wang. 2014. A review of recent studies on sustainable urban renewal. *Habitat International* 41: 272–79. [CrossRef]
- Zhou, Zhigang. 2014. Shenzhen Urban Renewal Mode Choice and Suitability Study. In *Proceedings of the 17th International Symposium on Advancement of Construction Management and Real Estate*. Berlin/Heidelberg: Springer. [CrossRef]
- Zhu, Yu, Liyue Lin, and Wenqian Ke. 2016. Trends in Internal Migration and Mobility: International Experiences and Their Implications for China. *Population Research* 40: 50–58.

Community Building through Public Engagement: Variety in Europe and China

Thea Marie Valler, Marius Korsnes, Jiayan Liu and Yulin Chen

1. Introduction

Community building and public participation are closely intertwined, to the extent that community building arguably cannot exist without public engagement and participation. However, the types of participation, the degree to which it happens, and—importantly—which actors are involved vary considerably. Community building is a key part of the socially integrative city. One of its characteristics is precisely to foster “social capital and engagement of local stakeholders” (see Table 6, Chapter 2, this volume). This chapter takes a closer look at public engagement across cultural contexts in Europe and China. Thereby, we seek to highlight that participation and “the public” are not unilateral, pre-given categories that can be understood uniformly around the world. Indeed, relying on “specific pre-given meanings, forms, and qualities of participation” may cause confusion and hamper participation by overly simplifying the multiple varieties of contemporary public engagement that exist (Chilvers and Kearnes 2019, p. 3).

In a relational and co-productionist perspective, as employed here, publics are thought of as being actively mediated and occurring through the performance of participatory practices (Chilvers and Kearnes 2019). Thus, instead of viewing the public as a predefined mass considered to be an aggregate of autonomous individuals, we here take publics to occur through local processes different in each case, leading us to define multiple forms of publics, forms of engagement, and types of communities in Europe and China. In this chapter, engagement is understood as an enabler of successful participation, while participation is the act of taking part in, shaping, and/or leaving an imprint on society, in this case, a community, in one way or another. To analyze different forms of participation, we apply a modified framework of the classical participation ladder developed by Arnstein (1969), with a dimension added based on Chilvers et al. (2018), including initiatives that are not necessarily formally recognized by authorities.

We briefly go through a variety of understandings of community building, engagement, and participation, and then review three cases from Europe and three cases from China to show differences and similarities in participation strategies. While we have chosen cases from China and Europe, it is important to note that we are not comparing community building in China and Europe in general. Instead, our contribution is an attempt at starting to think about community building across organizational, political, and cultural contexts. By doing so, we seek to contribute

with a perspective addressing the essential question: how do people participate in and build communities in different ways in different cultural entities across large geographical distances? There are various ways in which we can think of participation in contemporary democratic systems in Europe. This variation is even greater when expanding our gaze across continents to state-led and centralized countries such as China.

In this endeavor, we pursue the following research questions:

- How can the relation between community building and public engagement be understood in selected cases from China and Europe?
- To what extent and in which ways are residents engaged in community building? Which strategies are applied, and how does this differ between the geographical areas?

2. Materials and Methods

In this chapter, we apply a case study approach to public participation in community building. In the process of choosing cases, it is often advisable to work on cases that are both practical and appropriate, and our cases are a mixture of these two considerations. For example, there is a bias in the case selection towards cities we are ourselves located in and/or familiar with. There is also a bias in the case selection towards more affluent regions of both China and Europe, namely, coastal China and North/Western Europe. Therefore, it is important to note that these cases are not meant to be representative of China and Europa as a whole. Despite these limitations, we have still attempted to select cases that display great variety in public participation strategies, both within and across Europe and China. Thus, there is diversity of actors, strategies, size, types of places, and outcomes. We have selected cases where public participation strategies can be argued to empower residents and cases where this outcome appears more questionable. In order to display this degree of variety, we have chosen a relatively large number of cases, with six in total. This number will limit the degree to which we can discuss the cases in depth. However, the variety it provides sheds light on the diversity of challenges and emphasizes community building's highly localized nature, as well as shedding light on the fact that public engagement is not a straightforward or easy process.

Cases that deviate from what is commonly held or challenge our interpretation of a phenomenon are often referred to as disconfirming cases. By contrast, typical case sampling illustrates what is considered somehow the normal or average (Hay 2008, pp. 70–72). In this chapter, the cases can be understood as both typical and deviant (Hay 2008; Moses and Knutsen 2012). Given that the chapter aims to show diversity, we have not systematically or statistically verified the extent to which the cases are typical of deviant. To gather information on the cases, we have relied on

secondary sources such as reports, news articles, and government websites, as well as academic literature, in addition to our first-hand knowledge of the places.

3. Understandings of Community Building

Communities can be understood in a variety of ways, relating, for instance, to people, geography, social ties, and a sense of belonging (see, e.g., Chen et al. (2019) for a comparison between China and Europe in this regard). Communities are not merely neighborhoods, as neighborhoods are defined by their geographical boundaries. In this chapter, we think of communities as social ties (Wellman 2018), and community building is, therefore, the facilitation or enabling of such ties. We here also recognize that such facilitation or enabling is strongly shaped by the material surroundings in which social ties exist and the interaction between them. In community building, the material and the social are closely interwoven and interdependent. As argued by Manzo and Perkins (2006), an emotional attachment to a place can motivate cooperation to improve a place-specific community. This, in turn, reflects the concept of the socially integrative city, which encompasses both social and material relations.

One of the key challenges to building stronger relations among people in Europe in recent years is social divisions (Andersen and Kempen 2003). Both in China and Europe, increasing economic differences will inevitably harm community building and social integration in cities. According to scholars such as Sassen (2000), increasing social inequality and building down of the welfare state have led to increased segregation in cities. The concept of the dual city (see, for example, (Mollenkopf and Castells 1991)) can be used to describe the division of cities into areas of included and excluded people (Andersen and Kempen 2003). Further, migration (rural–urban and international) brings about new divisions between people, both within and beyond existing hierarchies. Such divisions do not only bring new challenges to social integration but also to participation. Achieving socially integrative cities requires us to ensure increased “Social and ethnic integration, improving neighbourly community life” (see Table 4, Chapter 2, this volume). When discussing community building and public engagement, the questions of who influences the future of their city and neighborhood in which they live become central. Another pressing issue is whether it is possible to overcome power differences when conducting community building and which tools are appropriate for taking differences into account, an issue we will return to. Before moving on to the cases, we will look at how we can understand participation in a European and a Chinese context.

4. Multiple Forms of Participation

4.1. Europe

Until a few decades ago, apart from regular deliberative democratic processes such as voting in local or national elections, planning at the neighborhood level has largely been reduced to compliance or opposition to government plans. In most cases, residents were therefore not included in decision-making processes. The means of participation would be silent compliance or protest (Teernstra and Pinkster 2016). Today, bottom-up, participatory, and inclusive decision-making processes are very much buzzwords in urban planning to such an extent that participatory planning is seen as the way of doing governance (Teernstra and Pinkster 2016; Stelzle and Noennig 2019). It has been common for governments to release plans on the topic (see, for example, Regjeringen 2014). Tools such as questionnaires, focus groups, dialogue meetings, workshops, planning forums, and different outreach forms through social media have become popular.

While there might be a strong willingness to include citizens, a range of practical obstacles can make it difficult. Finding methods and tools that engage people is often challenging. What level people should be involved at is also an important issue. Should residents be involved from the very beginning or later in the process by having more of a consulting role?

It is also important to be aware of the adverse consequences that more superficial forms of participation can have. In recent years, scholars have pointed out that participation strategies sometimes can function as legitimation for public plans, rather than being rooted in a community. This form of participation can cover over pre-determined, vested interests (MacLeod 2011). Simply put, if a shopping mall is planned in your local park, and you are given a choice between nine and ten stories, are you participating or legitimizing the process? Therefore, one must be mindful to avoid that participation strategies become a way of legitimizing undemocratic types of planning and decision making (Rosol 2010). This type of “checklist participation” is particularly a risk if participation strategies lack critical engagement with structural inequalities in a place (Hilbrandt 2017).

The challenges of achieving participation have already been discussed by Arnstein (1969) in her classification of participation methods. This framework, developed in an American context, is among others modified by Stelzle and Noennig (2019) based on data from Germany. As participation varies significantly, this framework is wide enough to be applicable across many European countries and, arguably, China. We here refer to the modified framework, as it is updated to newer empirical findings. Their ladder of participation ranges from “information” to “empowerment”, depending on the degree of influence from the public. The usefulness of this ladder framework is that although all of these forms can be called

“participation”, the framework clearly shows how the various forms of participation differ in how seriously they are taking public engagement.

In all of the steps mentioned in Table 1, except “empowerment”, the responsibility of the final decision is in the hands of the authorities and not the public. Further, in all the steps, the initiative assumes some degree of government involvement to render participation legitimate, which may be regarded as a weakness of the framework. As we will see in the examples below, this is not always the case, as initiatives can also be bottom-up and stem from grassroots organizations.

Table 1. Ladder of participation. Source: Data based on Stelzle and Noennig (2019).

Information	Provide information to the public about the issue at hand
Consultation	Adjust already existing plans according to feedback from the public
Involvement	Include the public in all of the planning processes to make sure that the concerns of the public are taken into consideration
Collaboration	Working together with the public on all aspects of the project and allow the public to weigh in on overall prioritizations
Empowerment	The public has the first and final say in the decision

When discussing who participates in community building, we must also touch upon the different groups of actors. Wolfram (2016), for example, points to NGOs, households, and neighborhood associations. Further, private developers are also increasingly having a say (Hilbrandt 2017). Further, in parts of Europe, membership-based housing developers are important actors. As we will see from the examples, various organizations such as sports teams, art networks, and grassroots organizations can be involved as well.

Chilvers et al. (2018) pointed out that participation can be identified through a wide variety of bottom-up and top-down initiatives. The more centralized, dominant types of participation are, for instance, public opinion surveys and behavioral change, and the more decentralized and emergent types of participation include speculative design or cycling action groups. In between these two groups, Chilvers et al. (2018) identified more “diverse participation”, encompassing artistic engagement, co-design, community groups, or activism. In the UK, the more centralized methods are considered more legitimate, which can discourage other forms of participation. If we compare these types of participation with the modified “ladder of participation” presented above, we could say that the more centralized forms—i.e., the government-recognized ones—of participation are covered in the ladder, whilst the diverse and decentralized participations add another dimension to our understanding of participation. The reason this dimension needs to be added is that such initiatives in our understanding represent forms of participation, although

central authorities do not formally acknowledge them. These forms of participation typically come into play when formalized processes fail or are inexistent—but they are equally important to analyze. Although there surely may be more, the multiple forms of participation identified in this section imply that participation can be understood as a broader phenomenon. That has strong bearings at a local community level, also relevant in a Chinese context.

4.2. *China*

In China, in the field of planning, according to the state law of urban–rural planning (Urban and Rural Planning Law of the People’s Republic of China 2008), information, discussion meetings, and public hearings are required before a plan is submitted for approval. However, in practice, the details of participation, including who, when, and how, are not clearly identified or mandatorily required in regulations. The public is often ignored in planning processes, left as passive receivers of plans rather than active participants (Enserink and Koppenjan 2007; Zhou et al. 2019; Hensengerth and Lu 2019; Chen et al. 2020). For example, notices are more like “notifications” than “negotiations”. Public hearings, questionnaire surveys, and interviews may have issues such as insufficient representation and inadequate discussion, which are led by governments or elite planners.

With the rapid development of urbanization, more and more cities have entered the period of urban regeneration, and the awareness and desire for public participation have gradually increased. In the report of the Third Plenary Session of the 18th Central Committee of the Communist Party of China (CPC) in 2012, the idea of “social governance” was first raised, replacing the former “social management”, emphasizing the negotiation process, reaching consensus and joint action between a diverse range of actors. The report of the 19th National Congress of the CPC in 2017 further emphasized the need to deepen social governance through institutional improvement, including the mode of party committee-led government taking responsibility, social cooperation, public participation, and legal system guarantees, in order to realize co-creation, co-governance, and co-sharing.

Since the 2010s, community planning and community governance have emerged in some metropolises such as Beijing, Shanghai, and Chengdu. Compared with the traditional “Danwei Courtyard” and residential areas as the passive objects of the government’s top-down socio-economic management and developers’ spatial design, these new activities emphasize more the participation of multiple community actors in planning and construction, as well as the formation of the sense of community belonging and identity. Liu and Wang (2019) identified four different models of recent community planning cases in China according to the key promoting drivers, including government leadership, design intervention, participation from scholars, and social organizations’ support. It shows that, though most cases of

community planning and community building in China nowadays are state-led, or at least under the administration and supervision of the government, more and more social forces have taken part in community planning and community building processes, including social organizations, real estate developers, community planners, scholars and students, and residents inside and outside the community (Liu and Shen 2020). In reality, there have been multiple forms of public participation in community building. Examples include community consultation meetings, Open Space Technology conferences, multi-actor joint meetings, public hearings, participatory design workshops, participatory community garden building, online voting, and participatory budgeting, among similar examples (for more examples, see, e.g., Bonino et al. 2020).

5. Examples of Participation

5.1. *Three Examples from Europe*

A summary of the three cases selected from Europe can be found in Table 2. As noted in the Methods section, the cases are selected based mainly on the researchers' knowledge and meant to reflect a variety of participation types. However, they should not be understood as representative of Europe as a whole.

5.1.1. Tøyen, Oslo, Norway

Following the decision to move one of the most important art galleries in Oslo, the Munch Museum, the city government decided to allocate funding of about 14 million euros to the area where the museum used to be. The program went under the name *Tøyenløftet* (2012–2017). It was defined as “a method in which physical and social measures should contribute to comprehensive, lasting and locally anchored development work”¹ (Oslo Municipality 2020). The decision to implement the project resulted from a political compromise, as there was substantial opposition to the relocation of the museum in the first instance. At the same time, there was a need for political action, as the demographic and socio-economic development was becoming increasingly polarized, and marginalized groups were living side by side with young, highly educated residents (Brattbakk et al. 2015). The money was to be spent on different measures that would increase the quality of life for local inhabitants, including renovation of the local library. Several of the measures were also aimed at environmental measures, such as encouraging walking and biking as a means of transport (Linstad 2018).

¹ Translated by the author.

Table 2. Overview of European cases.

Place	Organizer	Participants	Objective	Platform	Type of Participation
Tøyen, Oslo, Norway	Municipality, city government	Local inhabitants, municipality, police	Reduce gentrification, increase house ownership	Tøyenløftet	Consultation
Tempelhofer Feld, Berlin, Germany	First city government, then local grassroots	Municipality, local inhabitants	Keep the park as public space	100% Tempelhofer Feld	Information/consultation, then it moved to diverse/decentralized participation
Svartlamon, Trondheim, Norway	Grassroots, local initiative	Local inhabitants, well-known artists, writers, and musicians	Alternative form of organizing housing	Svartlamon Experimental Zone	Diverse/decentralized participation, which enabled collaborative participation

A central part of the plan was that the most marginalized groups should be encouraged to participate in the planning process. In order to reach that goal, in 2016, a local council (*Tøyenrådet*) was established. The council consisted of residents and representatives from local organizations. However, they struggled with a lack of attendance, and at times there were not enough members present to constitute a quorum. Therefore, an alternative body (*Lokalstyret for Tøyen*) was established to make the necessary decisions, with representatives from the public, the police, and the national education bureau. However, central planning documents still remained untouched (Linstad 2018). Public hearings were also held but later criticized for not reaching out to disadvantaged groups. These issues were highlighted in a report commissioned by the municipality: children and disadvantaged groups, such as people living in communal housing, had not been adequately consulted (Kommunerevisjonen 2018). Thus, while the program was initially meant as a prestigious project for local politicians, in retrospect, it has been heavily criticized.

As a part of the project, some residents were forced to either purchase the apartment they were renting for 80% of the market value or move. While this was meant as a social policy, several families could not afford this and were forced to move (Vestreng 2018). The project had allocated substantial funding to activities, the library, language learning, education assistance, parks, and recreational facilities, but residents' actual participation was limited. The problem of gentrification was very real.

This example shows how good intentions to include the public in decision processes are not always enough to achieve participation. The lack of participation should hardly be attributed to low interest from the local community in the future of the area. Instead, one may question how and by whom the ground rules for

participation are laid out and to what extent this fits the local residents. When the ground rules are already in place without a negotiation process, the motivation for participation may be low, showing the weakness of the “consultation” approach in the participation ladder framework. In the next example, we see how the ground rules for participation may be rejected altogether.

5.1.2. Tempelhofer Feld, Berlin, Germany

In 2008, air traffic ceased in Tempelhofer Feld Airport in Berlin (Liebeck et al. 2016). From 2010, the 300 hectares of open land was free to use as a gigantic park, and a popular spot for recreational and organized activities. However, city authorities had not planned for it to stay that way and had planned for office spaces, commercial areas, housing, and a large public library, as well as both affordable and more expensive apartments. Even though the plan was to build on only 25 percent of the land, the proposition met much local resistance, and a heated public debate arose (Fahey 2015). The resistance was also partly driven by disbelief that no more of the land would be used for development and distrust that a fair share of the housing would be affordable (Hilbrandt 2017).

From before the fall of the wall, Berlin has a history of community activism in city planning. Due to this history, public participation needed to be prioritized on the political agenda when deciding the area’s future. Residents were invited to take part in the planning process through randomized surveys and visits, and online dialogue meetings. Neighbors were also invited to workshops to discuss the park’s design and the need for leisure activities. These participation strategies, therefore, resemble the “consultation” stage of the participation ladder.

However, the planning strategies turned out to be controversial among civic groups (Hilbrandt 2017). One of the primary reasons was that much of the premise of the plans was already set before the public got their say. In other words, the major lines were drawn, and the public only had a small bit of wiggle room. In retrospect, planners also acknowledged that participation was suspended at critical periods of time to hamper a broader public debate. Therefore, in this case, Hilbrandt (2017) argued that participation was not designed to inform planning but rather to give the processes legitimacy, ending up depoliticizing the planning processes. In other words, the planning processes were thereby more of a “consultation” (Stelzle and Noennig 2019).

The processes took a somewhat unexpected turn, as residents did not accept the range of choices. A local initiative, called “100% Tempelhofer Feld”, gathered enough signatures to hold a referendum to decide what to do with the area, and 65 percent wanted to keep the whole area as a recreational facility without any housing development (Hilbrandt 2017; Fahey 2015). By that time, the area was already well-established and a popular destination for barbeques, kite flying, exercise, and

gardening. Further, as an area with a history of war, the area had turned into a symbol of freedom, which made it hard to redevelop it into a housing district (Fahey 2015). In this way, Berliners took the planning process in their own hands and moved it up the participation ladder—so to speak.

The next example differs as the original initiative does not stem from local authorities but rather the local residents themselves.

5.1.3. Svartlamon, Trondheim, Norway

This example from Svartlamon in Trondheim, Norway (TRANS-URBAN-EU-CHINA 2018), fits best under the so-called “diverse participation” category defined by Chilvers et al. (2018) since it is neither emergent nor dominant. Through the lens of the participation ladder, it can be understood as a case of “empowerment”, but only after a protracted local lobbying process aimed at getting the municipality on board. Svartlamon is a small and experimental community with a diversity of participation initiatives that are not mainstream. According to their official webpage, Svartlamon is “Norway’s first urban ecological area, prioritizing environmental sustainability with a flat organizational structure, a transparent economy, low standards, and cheap rents”. Most of the buildings were built at the end of the 19th century or the beginning of the 20th century.

Svartlamon is a result of many years of political struggle. It culminated in 2001 when the city government decided to rehabilitate and not demolish the existing buildings and develop the area as an experimental arena with a more flexible regulation plan. Before this, in 1996 and 1997, the preservation of the neighborhood engaged a large number of people in Trondheim, amongst them several artists, writers, and musicians. This engagement likely contributed to turn the decision not to demolish the area. A landmark building, which for some time served as Norway’s tallest wooden building, completed in 2005, was built there as the first new construction after this reorganization (Svartlamon.org 2020). Svartlamon is (legally) administered through two trusts (one for commercial properties and one for housing) where the inhabitants and the city parliament both elect members of the steering committees. Amongst the many local initiatives, there are shared gardens, an annual festival called “Eat the Rich”, a local free/exchange shop, a pub, a stage and concert area, and several smaller spaces for exhibitions.

Internally, the area is structured with a housing association where all inhabitants are members. There is a monthly “district meeting” where decisions pertaining to the area are made, following the consensus principle. In addition, the area is divided into five neighborhoods with their own “local democracies” where decisions concerning the specific neighborhoods are made, and representatives for the different internal groups and committees are chosen. The development of the area itself is “dugnad”-driven, meaning that people volunteer to help each other out. Long-term

municipal ownership of the district has been an important framework condition for allowing the type of local culture that has been established there (Østerli 2017). The inhabitants of Svartlamon have “played an important part in the housing management where the prevailing value of life quality instead of money” (Østerli 2017, p. 65), and the inhabitants have been crucial in preserving and maintaining local community heritage protection (Østerli 2017). In this sense, it is a community that was reinforced and built its identity through public engagement.

5.2. Three Examples from China

In Table 3, three frontier community building cases in recent urban China are selected, with different organizational structures and participant compositions according to their specific background. The organizers act as the main leaders to provide major resource support and include local governments, professionals, NGOs, and developers, while participants include planners, designers, social organizations, real estate management companies, local residents and enterprises, and so on. Da-Shi-Lar, Chuangzhi, and Qinghe can be arranged accordingly, with the former having a more top-down structure with government and elites taking the lead, and the latter have broader forms of public participation. The cases are selected from Beijing and Shanghai because of the complexity and diversity of the cases in these two metropolises, and also because they include highly government-controlled projects and bottom-up engagement. However, what unites them is the municipal government’s strong determination to promote social governance and community development. Another considerable reason is the authors’ long-term attention to these cases, even as the main personnel involved in them, allowing first-hand data collection and deep knowledge of the cases.

Table 3. List of community building cases in China.

Place	Organizer	Participants	Objective	Platform	Type of Participation
Da-Shi-Lar, Beijing	District government	Planners and designers, social organizations, residents	Historic area preservation and revival	“Dashilar Platform”, Beijing International Design Week	Information, consultation, involvement
Chuangzhi, Shanghai	Developer, NGO	Social organizations, residents	Environment improvement	Community garden	Information, involvement, collaboration
Qinghe, Beijing	Jiedao Office, professionals	Residents, real estate management companies, local enterprises	Social governance innovation	“New Qinghe Experiment”	Information, consultation, involvement, collaboration, empowerment

Sorted by the authors based on relevant data.

5.2.1. Da-Shi-Lar, Beijing

The Da-Shi-Lar area, located at the center of the Old Beijing City, has been one of the most prosperous commercial areas since the Ming Dynasty. It is famous for maintaining the historic urban fabric and traditional lifestyles in hutongs for hundreds of years. In recent decades, it has gradually declined with severe physical and social problems. Both the population and facilities have been aging, in addition to narrow roads, poor living conditions, and the concentration of disadvantaged groups.

Since 2010, the Xicheng District government initiated a series of urban regeneration projects in the Da-Shi-Lar area. In contrast to the former approach of large-scale demolition and redevelopment, most projects involve renovation at smaller scales of courtyards and hutongs, making the renovation more flexible, operable, and beneficial to retain the texture of the old city. One important method to facilitate public participation in regeneration is the establishment of the “Da-Shi-Lar Platform” by the Xicheng District government. It has functioned as an open cooperation platform, attracting a large number of diverse social groups and resources into the whole process, including planners and designers, social organizations, local residents, and businesses who bring their ideas, workshops, and projects into this area, thus achieving both old city protection and socio-economic revitalization (Jia 2016).

The regeneration of the Da-Shi-Lar area can be divided into three phases. In the first phase, called “pilot practice”, much attention was paid to improving people’s living conditions and solving relocation and compensation for residents who voluntarily moved to release development space. At the same time, the improvement of the infrastructure was initiated, the “Da-Shi-Lar Platform” was established, and several key issues were explored through small-scale trials. Such trials included finding solutions to how the old buildings could be renovated, what kind of business could enter, and in what ways. In the second phase, “community participation”, the goal of community building and the new way of multi-party cooperation were proposed. The work of community building was carried out in a flexible way based on residents’ and entrepreneurs’ diverse characteristics and needs. In the third phase of “integrated development”, the government retreated to roles such as the supervision of public service and management, formulating the rules for urban planning and industry operations to facilitate local participation and leave space for the community to prosper.

For example, in the façade repair work of Yangmeizhu Xiejie, the renovation proposal was consulted with each household, and the agreement was signed separately. In this way, diverse building property rights and features and the households’ willingness were respected and maintained to the greatest extent, ensuring a smooth implementation of the renovation plan. In order to secure the non-material cultural heritage and revitalization of the local handicraft art, different activities were started, such as introducing design groups, locating local talent, organizing workshops, and different

forms of community activities. For instance, some senior neighbors took the initiative to contribute with old photographs that documented decades of community history, which later inspired more residents to participate.

This case would fall under the categories of “information”, “consultation”, and “involvement” in the participation ladder framework, i.e., the public is included and has the opportunity to weigh in on overall prioritizations.

5.2.2. Chuangzhi, Shanghai

The Chuangzhi Community Garden is located in Chuangzhi Tiandi Park in Yangpu District, Shanghai. The Chuangzhi Tiandi is a public activity center and an innovative service center where universities, a science and technology park, and neighborhood communities join together and interact with each other. The garden was a typical vacant space left open after rapid urban development because of a municipal pipeline passing through underground. Since 2016, the developers of this area, such as the Yangpu Science and Technology Innovation (Group) Co. Ltd. and the Hong Kong SHUI ON LAND Group, cooperated with a non-profit organization named “Siyecaotang” and renovated the land into the first community garden in Shanghai, with the main idea of permaculture with wide community engagement. After renovation, the Chuangzhi Community Garden became a community public space integrating leisure services, public activities, community agriculture, and landscape, promoting nature education, neighborhood communication, and community resource sharing.

There are four main types of actors in the process of the renovation and operation of the Chuangzhi Community Garden: the local government, enterprises, social organizations, and residents. At the government level, the Wujiaochang Jiedao Office, as the territorial administrator, helped establish the community self-governance mechanism with a “self-governance office” as the leading operator. The local government also promoted public participation in community development through multiple channels, for instance, by purchasing social services from social organizations. In addition, the Chuangzhifang community residents’ committee has offered information and support and organized residents’ participation from the beginning of the project, which have played an essential role in community integration and interaction. As the most important impeller, the Chuangzhi Tiandi of SHUI ON LAND Group has provided the main funding to the building and maintenance of the garden. “Siyecaotang” conducts the technical guidance, daily maintenance, and activity organization work, functioning as a bridge between the government, enterprises, and residents. As for the residents, they participate in the use, management, and maintenance of the Chuangzhi Community Garden in different ways. After several years of operation, some community organizations have emerged and matured, playing an increasingly active role in the garden maintenance

and organization of activities, for example, the Huayou Club consisting mainly of seniors, the Little Volunteers consisting mainly of children, and the Fashion Horticulture with mostly young people. There are many sub-topic areas, with beautiful and characteristic sceneries, which are co-designed and claimed by different groups, including the community organizations, nearby institutions, and households. Further, the “nature classroom” in the community garden is now open to the public, with special priority given to community residents’ self-organizing activities.

Since the community garden project is evident in participatory construction and maintenance by local inhabitants under professional organizations’ guidance, it fits best under the categories of “information”, “involvement”, and “collaboration” in the participation ladder framework.

5.2.3. Qinghe, Beijing

Qinghe Jiedao is located in the Haidian District, northwest of the central urban area of Beijing. With the rapid urbanization process, today’s Qinghe has changed from the original rural town into a sub-district (“Jiedao”) on the periphery of Beijing’s central urban area.

Since 2014, a group of scholars and students from different departments of Tsinghua University, including sociology, urban planning, architecture, landscape and, fine arts, have conducted a series of work combining community governance with participatory community planning, with close collaboration with the Qinghe Jiedao Office. This project, called the “New Qinghe Experiment”, concentrates on inspiring the vitality of the community, promoting public participation, and exploring how governmental management and social self-organization positively interact. Central goals have been to restructure a more open and active grassroots governance platform, establishing consultation and coordination mechanisms at the community level, as well as carrying out a series of participatory design projects with a full collaboration of community leaders, residents, social organizations, real estate management companies, and local government (Liu and Deng 2016; Liu et al. 2017).

Since 2018, an innovative community planning system has been established, consisting of a group of community planners from different disciplines working together with the communities and the Tsinghua group. The planning system has contributed to bridging the top-down processes, resource support, and supervising the local government. It has also included bottom-up, participatory planning processes allowing for issues to be raised and an implementation process for an overall sustainable development of the local community. For example, the consultation system has been established in pilot communities, which is planned to cover all communities in 2021. The consultation system is meant for the community resident committees to raise major community issues and initiate consultation with the relevant government departments, property management institutions, residents, social

organizations, community planners, etc. Community capabilities of organization and mobilization have been improved through targeted training and workshops. Through “micro incentive funds”, community talents and organizations have been mobilized to discover community weaknesses, propose solutions, and promote implementation, such as façade upgrading of residential buildings, bench renovation, and community gardens. Moreover, the committee of property management institutions or residents’ self-organization has been encouraged to be established to better manage and maintain the renovated public space (Liu et al. 2020).

Due to its grassroots nature and attention to public engagement, this case includes the “information”, “consultation”, “involvement”, and “collaboration” categories and even steps, to some extent, into “empowerment” in the participation ladder framework.

6. Cross-Cutting Discussion of the Cases

There is no one-size-fits-all in public participation in community building, which these cases serve to highlight. Forms of participation in community building can further be as varied *within* China and Europe as *between*. The design of our study does not allow for a strict comparison between China and Europe as such. Instead, our focus is on the varieties in which community building can take place and how participation and engagement are mobilized differently. In this section, we revisit our research questions posited at the very beginning of the chapter.

First, the relation between community building and public engagement can be understood from the unique historical, social, organizational, and political circumstances in each country. For example, conflicts over demolishing versus preserving hutongs and other historical districts are highly specific to certain Chinese cities. Therefore, this backdrop is central in understanding how the approaches to Da-shi-Lar represent an alternative to urban planning in a Chinese context. The protection of historical districts allows Chinese residents and local governments to carry out community participation rather than large-scale redevelopment. In a similar vein, the emergence of the protest movement around Tempelhofer Feld in Germany can hardly be understood independently of the war history and Tempelhof’s contemporary symbolism related to freedom and peace and the importance of countercultures in Berlin. These specific contexts also have an important impact on how the public is engaged in community building—or sometimes rather how they become engaged due to a lack of inclusion in participatory processes—as the cases of Svartlamon and Tempelhofer Feld in Europe show. On this point, it is notable that the Qinghe case in Beijing has public engagement as a focus and starting point of the processes with an emphasis on community empowerment and then inspiring the vitality of the community.

Country-specific, as well as city-specific, differences in community building can both be related to socio-cultural factors, on the one hand, and the legal, political, and administrative, on the other. For instance, the overturning of the city-led participation process in Berlin should not be understood independently of socio-cultural aspects such as distrust in private developers, protest movements, and the park as an important social hub. Neither can the emergence of Svartlamon be understood without the existence of particular subcultures in Trondheim. Further, in more state-led forms of participation, such as Tøyen and Da-shi-Lar, how the local community engages in these projects is interrelated with issues such as experience and trust in decision-making processes. In both the Svartlamon and the Berlin case, worries from local inhabitants that the area would become more expensive and driven by business and profit interest triggered engagement. Interestingly, in the Chuangzhi, Shanghai, case, it was developers that took the initiative and used an abandoned (government-owned) plot to develop a community-oriented urban gardening project.

Second, the rationale or objective behind different forms of urban renewal projects is central to understanding how people are engaged and, ultimately, participate. People need to be engaged for them to be willing to participate. In Da-shi-Lar and Tøyen, the motivation for the projects was closely linked to the upgrading of housing without forcing inhabitants out of the area. Further, the goal was to make sure the process happened on the premise of local people. However, the government was still the key agent in these cases. In other words, the original initiative is derived from outside the local community, and parts of the premises are already set. As can be seen through Tables 2 and 3, we argue that participation was happening at the collaboration, involvement, or consultation level of the participation ladder in these cases. Svartlamon was also partly driven by a motivation to secure affordable housing and not leave buildings empty due to developers' housing speculation. The rationale of securing affordable housing and upgrading existing housing is crucial for Da-shi-Lar, Tøyen, and Svartlamoen. In Berlin, the 100% Tempelhofer Feld initiative was partly driven by disbelief in private developers' ability to secure affordable housing. Therefore, while issues related to housing are vital in many of these cases, how these objectives are mediated through the actors has important ramifications for the participation process. It appears evident that in the cases of Tøyen, Svartlamon, and Tempelhof, public engagement was considerably underestimated in the early project stages. In Svartlamon and Tempelhof, other forms of diverse and decentralized participation occurred due to this neglect. However, in Tøyen, the stakes appeared not to be high enough to trigger local engagement—i.e., participation process attempts failed.

Third, at which stage of the process residents are included influences their participation. This aspect can be related to the second point above regarding the projects' rationale; if residents are included early in the process, they might also

have the ability to shape the goals. However, since goals might not be negotiable, the stage at which residents are included should thus be considered as a separate aspect of our analysis. The participation ladder can be used as an indicator in this regard. According to this framework, to achieve collaboration, for example, the public must be involved in all aspects of the project. When residents are not included early, the process may appear alienating for some groups, as seen in the case from Tøyen in Norway. In such cases, lack of participation may be ascribed to a lack of interest, while it might instead be a deficiency in the process itself. Depending on the project, participation will be possible at different stages. However, the goals should remain that residents should be included as early as possible. However, there is a conundrum here: Participatory processes cannot be participatory—for all who are included throughout—from their inception since the initiators will have to set some initial frames for the participation to begin. Some actors might thus reject the process if they disagree with these initial frames. For example, the activities in a public library may be a relevant issue for a participatory process. However, it might be trickier to decide upon the types of participation (neighborhood meetings, school visits, polls) in a participatory manner. While this issue has to be solved on a case-to-case basis, aspects such as building trust, having a transparent process, and being able to adapt participation strategies will often be key.

While it is difficult to pinpoint the reason for this disinterest, lack of local anchorage of objectives could play a role. In other words, finding appropriate channels of participation is vital. Those initiatives that arise from the grassroots appear to be more strongly anchored in the local population and thus may achieve higher degrees of participation. However, on the other hand, those initiatives that arise mainly from a government's initiative should focus strongly on engagement, as the cases in China show, before participation can be expected.

7. Conclusions

This chapter showed that although there are differences in conceptualizations such as democracy and understandings of engagement and participation in Europe and China (Chen et al. 2019), there are many ways in which people can participate and ultimately build communities. Such processes will always be mediated through political contexts through compliance or resistance, and they can hardly be understood outside of their particular socio-cultural contexts. The examples from Europe and China illustrate the diversity in which community building can happen and the actors that can be included, such as university students, NGOs, developers, and, of course, residents. The examples also show the variety in the ways that community building can happen, as well as the outcome.

What unites the cases is the objective to enhance an area, in one way or another, and bring the public into the process. As the chapter highlights, this is not a

straightforward process. Sometimes, residents may not agree with the methods and premises of participation, which ironically can lead to stronger engagement, as Svartlamon's and Tempelhof's cases showed. These types of resistance highlight the need for deep-rooted participation strategies that sometimes need to go beyond consultation and bring people into the process of formulating the objective. In this manner, one may avoid participation being reduced to a depoliticizing machine where participation is a mere checklist for proceeding with developments. In such cases where, for instance, the local population is assumed not to care, local property developers could say that they "attempted" to engage in participatory processes but received no feedback. Lack of local anchorage or superficial ways of participation can sideline residents, implying that the focus should be on "how to engage" rather than ticking off participatory boxes. In this context, thinking about participation in terms of where it is located on the participation ladder or diverse and decentralized initiatives (Chilvers et al. 2018) can help understand the level of engagement and ultimately lead to successful community building.

Further, while the three European cases present different types of participation, the Chinese cases of community building are conducted within and in line with national strategies of local inclusion in decision-making processes and regulations. The three cases from China also show the variety of participation models within one country. They point out that an explicit focus on engaging people can be a way forwards to ensure participation, in turn underlining the idea that community building can arise from grassroots organizations, but also more formal, state-led initiatives. In this sense, public engagement processes are necessary components of community building—i.e., shaping the social and material ties that build a local community. While who the initiator is may inevitably have an impact on who is participating, projects with a more top-down approach may also involve a great variety of actors, as shown in the Da-Shi-Lar case. Going forward, finding models of community building and participation that are aligned with the best interests of a local population could have positive impacts on socially integrative cities globally.

Author Contributions: This article has several authors with different contributions as follows: J.L. and Y.C., and T.M.V. and M.K. contributed with cases and forms of participation in China and Europe, respectively. T.M.V. outlined and revised the manuscript with contributions from M.K. All authors read, revised, and approved the final manuscript.

Funding: Open access publishing is supported by NTNU.

Conflicts of Interest: The authors declare no conflict of interest.

References

Andersen, Hans Thor, and Ronald Van Kempen. 2003. New trends in urban policies in Europe: Evidence from the Netherlands and Denmark. *Cities* 20: 77–86. [CrossRef]

- Arnstein, Sherry R. 1969. A Ladder of Citizen Participation. *Journal of the American Institute of Planners* 35: 216–224. [CrossRef]
- Bonino, Michele, Alberto Bologna, Francesca Frassoldati, Maria Paola Repellino, Dalila Tondo, Fabrizio d’Aniello, Carla Danani, Pamela Lattanzi, Elisabetta Patrizi, Stefano Polenta, and et al. 2020. D1.2 Comprehensive Atlas of Approaches to Optimize Human and Cultural Drivers in Sustainable Urbanisation, Derived from the Transformative Knowledge. Available online: http://transurbaneuchina.eu/fileadmin/user_upload/tuec/files/Deliverables/TRANS-URBAN-EU-CHINA_D1.2_POLITO_20201111.pdf (accessed on 9 November 2020).
- Brattbakk, Ingar, Aina Landsverk Hagen, Monika Grønli Rosten, Oddrun Sæter, Jenny Osuldsen, Bengt Andersen, Erik Thorstensen, and Katja Bratseth. 2015. Hva nå, Tøyen? Sosiokulturell stedsanalyse av Tøyen i Bydel Gamle Oslo. The Work Research Institute’s Report Series 8/2015. Available online: <http://www.hioa.no/Om-OsloMet/Senter-for-velferds-og-arbeidslivsforskning/AFI/Publikasjoner-AFI/Hva-naa-Toeyen> (accessed on 9 December 2020).
- Chen, Yulin, Thea Marie Valler, Jiayan Liu, Jian Liu, and Marius Korsnes. 2019. Understanding Communities in China and Europe: Similarities, Differences and Consequences for Socially Integrative Cities. *China City Planning Review* 28: 17–24.
- Chen, Yulin, Lin Xiao, Mengping Chen, and Yang Jiang. 2020. Preliminary Exploration of Approaches to Community Participatory Planning: Case Study of “New Qinghe Experiment” in Beijing. *Urban Planning Forum* 2020: 65–70.
- Chilvers, Jason, and Matthew Kearnes. 2019. Remaking Participation in Science and Democracy. *Science, Technology, & Human Values* 45: 347–80.
- Chilvers, Jason, Helen Pallett, and Tom Hargreaves. 2018. Ecologies of participation in socio-technical change: The case of energy system transitions. *Energy Research & Social Science* 42: 199–210.
- Enserink, Bert, and Joop Koppenjan. 2007. Public participation in China: Sustainable urbanization and governance. *Management of Environmental Quality: An International Journal* 18: 459–74. [CrossRef]
- Fahey, Ciarán. 2015. How Berliners refused to give Tempelhof airport over to developers. *The Guardian*. March 5. Available online: https://www.theguardian.com/cities/2015/mar/05/how-berliners-refused-to-give-tempelhof-airport-over-to-developers?CMP=share_btn_link (accessed on 9 November 2020).
- Hay, Iain. 2008. *Qualitative Research Methods in Human Geography*. Oxford: Oxford University Press.
- Hensengerth, Oliver, and Yiyi Lu. 2019. Emerging environmental Multi-Level Governance in China? *Environmental protests, public participation and local institution-building*. *Public Policy and Administration* 34: 121–43.
- Hilbrandt, Hanna. 2017. Insurgent participation: Consensus and contestation in planning the redevelopment of Berlin-Tempelhof airport. *Urban Geography* 38: 537–56. [CrossRef]
- Jia, Rong. 2016. Regeneration and Development Mode of Da-Shi-lar Historical and Cultural District, Beijing. *Beijing Planning Review* 1: 8–12.

- Kommunerevisjonen, Oslo Municipality. 2018. Måloppnåelse og resultater i Områdeløft Tøyen. Available online: <https://www.oslo.kommune.no/getfile.php/13295230-1537788544/Tjenester%20og%20tilbud/Politikk%20og%20administrasjon/Budsjett%20C%20regnskap%20og%20rapportering/Rapporter%20fra%20Kommunerevisjonen/Rapporter%20fra%20Kommunerevisjonen%202018/10-2018%20M%C3%A5loppn%C3%A5else%20og%20resultater%20i%20omr%C3%A5del%C3%B8ft%20T%C3%B8yen.pdf> (accessed on 17 August 2020).
- Liebeck, Matthias, Katharina Esau, and Stefan Conrad. 2016. What to Do with an Airport? Mining Arguments in the German Online Participation Project Tempelhofer Feld. Paper presented at Third Workshop on Argument Mining, Berlin, Germany, August 7–12; pp. 144–53.
- Linstad, Arnstein. 2018. Kraftig kritikk av Tøyenløftet i ny rapport. 'De stille stemmene' ble ikke hørt. *Vårt Oslo*. September 17. Available online: <https://vartoslo.no/arnsten-linstad-gamle-oslo-hanna-marcussen/kraftig-kritikk-av-toyenloftet-i-ny-rapport-de-stille-stemmene-ble-ikke-hort/182357> (accessed on 8 August 2020).
- Liu, Jiayan, and Xiangyu Deng. 2016. Community Planning Based on Socio-Spatial Production. *China City Planning Review* 40: 6–13.
- Liu, Jiayan, and Yuying Shen. 2020. Community Planning: Practice of Participatory Socio-spatial Reconstruction. *WA*, 10–15.
- Liu, Jiayan, and Tianfu Wang. 2019. *Social Practice of Community Planning: Participatory Urban Regeneration and Community Rebuilding*. Beijing: China Architecture & Building Press.
- Liu, Jiayan, Xiaoyan Tan, and Qingyi Cheng. 2017. Practice and Reflection of Participatory Community Planning under the Background of Transformation: A Case Study of Y Community, Qinghe District in Beijing. *Shanghai Urban Planning Review* 2: 23–28.
- Liu, Jiayan, and et al. 2020. *Community Planner: Institutional Innovation and Practice Exploration*. Beijing: China Architecture & Building Press.
- MacLeod, Gordon. 2011. Urban Politics Reconsidered: Growth Machine to Post-Democratic City? *Urban Studies* 48: 2629–60. [CrossRef]
- Manzo, Lynne C., and Douglas D. Perkins. 2006. Finding Common Ground: The Importance of Place Attachment to Community Participation and Planning. *Journal of Planning Literature* 20: 335–50. [CrossRef]
- Mollenkopf, John Hull, and Manuel Castells. 1991. *Dual City: Restructuring New York*. New York: Russell Sage Foundation.
- Moses, Jonathon W., and Torbjørn L. Knutsen. 2012. *Ways of Knowing: Competing Methodologies in Social and Political Research*. Hampshire: Palgrave Macmillan.
- Oslo Municipality. 2020. Områdeløft Grønland og Tøyen. Available online: <https://www.oslo.kommune.no/slik-bygger-vi-oslo/omradeloft-gronland-og-toyen/#gref> (accessed on 18 June 2020).

- Østerli, Tone. 2017. Svartlamon–kunnskap, opplevelse og bruk. En studie av verneverdier i bygninger og kulturmiljø. Maste's thesis, NTNU: Norwegian University of Science and Technology, Trondheim, Norway. Available online: <https://ntnuopen.ntnu.no/ntnu-xmlui/handle/11250/2455341> (accessed on 3 October 2018).
- Regjeringen. 2014. Guide: Public Participation in Planning: How to Facilitate Increased Public Participation and Influence in Municipal and Regional Planning pursuant to the Planning and Building Act. *Norwegian Ministry of Local Government and Modernisation*. Available online: https://www.regjeringen.no/contentassets/7fa15b41220849c9adba3eeea28538ec/medvirkning_veileder_engelsk.pdf (accessed on 27 April 2021).
- Rosol, Marit. 2010. Public Participation in Post-Fordist Urban Green Space Governance: The Case of Community Gardens in Berlin. *International Journal of Urban and Regional Research* 34: 548–63. [CrossRef] [PubMed]
- Sassen, Saskia. 2000. *Cities in a World Economy*. London: Pine Forge Press.
- Stelzle, Benjamin, and Jörg Rainer Noennig. 2019. A method for the assessment of public participation in urban development. *Urban Development Issues* 61: 33–40. [CrossRef]
- Svartlamon.org. 2020. Byøkologi. Available online: <http://svartlamon.org/category/byokologi/> (accessed on 27 June 2020).
- Teernstra, A. B., and Fenne M. Pinkster. 2016. Participation in neighbourhood regeneration: Achievements of residents in a Dutch disadvantaged neighbourhood. *Urban Research & Practice* 9: 56–79.
- TRANS-URBAN-EU-CHINA. 2018. D1.1 Report, Including Good Practice Examples in Europe and China, Derived from the Knowledge Base. Available online: http://transurbaneuchina.eu/fileadmin/user_upload/tuец/files/results/TRANS-URBAN-EU-CHINA_D%201.1_POLITO_%2020190129_V4.0.pdf (accessed on 11 November 2020).
- Urban and Rural Planning Law of the People's Republic of China. 2008. Revised in 2019. Available online: http://www.china.org.cn/china/LegislationsForm2001-2010/2011-02/11/content_21899292.htm (accessed on 27 April 2021).
- Vestreng, Tom. 2018. Må kjøpe leiligheten sin eller flytte fra Tøyen. *Dagsavisen*. February 20. Available online: <https://www.dagsavisen.no/oslo/ma-kjope-leiligheten-sin-eller-flytte-fra-toyen-1.1103971> (accessed on 11 December 2020).
- Wellman, Barry. 2018. *Networks in The Global Village: Life in Contemporary Communities*. New York: Routledge.
- Wolfram, Marc. 2016. Conceptualizing urban transformative capacity: A framework for research and policy. *Cities* 51: 121–30.v. [CrossRef]
- Zhou, Yijun, Lei Hou, Yu Yang, Heap-Yih Chong, and Sungkon Moon. 2019. A comparative review and framework development on public participation for decision-making in Chinese public projects. *Environmental Impact Assessment Review* 75: 79–87. [CrossRef]

Transformative Factors of Post-Industrial Urban Spaces in China and Italy

Badiaa Hamama, Maria Paola Repellino, Jian Liu and Michele Bonino

1. Introduction

The transition to a post-industrial society in both China and Italy triggered changes to their economic and political systems. This resulted in profound transformations that had an enormous influence on the social and physical structure of their cities.

In China, the market-oriented economic reforms of the 1980s sparked radical urban transformation and new challenges (Gaubatz 1995; Hsing 2010). The advent of new market forces in a realm that was predominantly public during the industrial era (Ma and Wu 2005) sparked substantial transitions in community building and place making (Hamama et al. 2019). The pre-existing urban spaces, originally produced to serve the socialist ideology and industrial production, have been transformed to meet the new market mechanisms and standards of the post-reform era. This period of radical change was characterized by a desire to boost rapid economic growth and transform China's industrial-based socio-spatial structure. It was within this environment of great adjustments that Chinese cities witnessed an unprecedented increase in the involvement of real estate industries and market forces in the (re)development of urban land, often resulting in the process of growing social dissent (Mars and Hornsby 2008) and other associated phenomena, e.g., the restructuring of local communities (Hsing 2010), the strengthening of local identity, and the rising of cultural and creative industries.

In parallel, since the 1980s, the post-industrial restructuring in Italy, and more generally in Europe, has led to important social and economic changes and the widespread cultural renewal of cities. In order to diversify the economy, promote a new urban image, and attract international investments, the municipal authorities in major European cities encouraged the implementation of cultural policies and strategies involving the reuse of existing building stocks (Bianchini and Parkinson 1993), the adoption of a creative economy (Howkins 2001), and social innovation (Florida 2002). The renovation of former industrial sites has become experimental fields for the definition of new models of urban development that is able to replace or complement its traditional industrial specialization. Starting from these places and the active preservation of their physical legacy, local administrations have tried to strengthen the relationship between urban space and the renewed social fabric.

Given the broadness of post-industrial (re)development topic, the complexity and diversity of the Chinese and Italian urban contexts, this research is designed in

the attempt to address two main questions: (1) How did the two countries approach the restructuring of their urban space in the post-industrial period? (2) What are the main drivers that influenced the resulting physical and social structure of post-industrial cities?

2. Materials and Methods

The research draws upon a literature review from the experiences of post-industrial urban redevelopment and regeneration in Beijing, Prato and Turin, and the analysis of selected case studies in these cities. The aim of the research is to provide an overview about the approaches and strategies adopted in the regeneration of post-industrial cities in China and Italy, to shed light on the factors and mechanisms that mostly influenced the physical and social transformation of their urban structure in a transitional period. For the literature review and data collection, China National Knowledge and Infrastructure database, the most comprehensive and recognized research engine in China, Google Scholar and Web of Science have been used. The selection of the case studies is based on the results of the analysis and investigation carried out by the authors in the last three years in the framework of the Trans-Urban-EU-China project and reported in the deliverable documents of its Work Package 1, Community Building and Place Making in Neighborhoods. As will be explained in details in the next section, the five selected cases cover a range of issues that reflect the complicated task of balancing the physical and social dimensions in the process of transformation of urban spaces in post-industrial China and Italy.

This study is not intended to strictly compare the Chinese and Italian reality, which we believe is an arduous task to comprehensively cover within this essay, due to the complexity and diversity of the social, economic and spatial factors and the mechanisms that contributed to reshape post-industrial cities in both China and Italy. However, in the limited space of this article, our attempt is to use the different perspectives adopted in the post-industrial period as a benchmark to reflect on the experiences of Chinese and Italian cities instead of a systematic comparison between the two urban contexts. Although these case studies do not provide a comprehensive catalogue of the numerous situations that exist, they highlight several issues that transcend the specificity of each context and become part of a debate on a much broader contemporary urbanization. The next section, Results, is structured in two main parts to analyze the Chinese and the Italian post-industrial environments, respectively, the factors and the driving forces behind the regeneration processes of their urban spaces. Each part contains an introductory section giving a more nuanced analysis of the main dynamics that characterized the transition from an industrial to a post-industrial period (first research question); and a more detailed section, which adopts case studies to illustrate and focus on the factors that have determined,

influenced and shaped the physical and social transformations of post-industrial cities (second question).

3. Results

3.1. *The Restructuring of Chinese Post-Industrial Cities: Readapting the Pre-Existing Urban Spaces to Meet the New Market Standards*

As a result of the transition from a planned economy to a market-oriented economy in the late 1970s, Chinese cities witnessed a turnaround from “cities of production”, typical of the socialist ideology that identified industrialization as one of its major goals, to “cities of consumption” in the post-industrial period. The abandonment of the socialist ideology of “production first, livelihood second”, characterized by strict top-down centralized state power and planned economy (Gaubatz 1995; Hsing 2010), and the inauguration of a new era of market-based economic reforms had a tangible impact on the Chinese society and the urban structure of its cities. Cities started to be viewed as a catalyst for economic growth and played an unconventional role in the country’s social and economic development. The almost homogeneous urban spaces that were produced after the establishment of the People’s Republic of China in 1949 were based on public land ownership and dominated by the emblematic *danwei* system (Gaubatz 1995; Bonino and Pieri 2015)—a unit of socio-spatial organization of the urban space into self-sufficient work units centered primarily on industrial production (Liu 2019). However, following the economic reforms, urban China experienced profound shifts, which dramatically influenced the production and (re)development of its urban spaces.

Two important events reshaped Chinese post-industrial cities’ physical and social structure: land commodification in the late 1980s and housing marketization in the 1990s. Land commodification became one of the salient restructuring tools in post-industrial China. Land has become the main financial asset for local governments (Hsing 2010). While, during the socialist period, urban spaces were produced mainly to serve the industrial production and communist ideology, in the post-reform era they were gradually remodeled to follow the market forces. The transition from a welfare-based housing system, the rise of a consumerist culture, and the establishment of a land and housing market dramatically redefined the Chinese urban structure (Wang and Murie 1999).

In the following sub-sections, the three selected case studies from Beijing, the capital city of China, shed light on a range of issues emerged in the post-industrial period, such as the (re)development of historical dwellings and socialist neighborhoods, with the consequent local conflicts, and the increasing focus of Chinese authorities on cultural and creative industries mainly for economic growth. In spite of the diversity of the cases, they all share one common characteristic:

the result of their (re)development was influenced and challenged by the logic of economic profit, which considerably influenced their physical and social structure. The case studies are illustrated following their geographical coordinates moving from Ju'er Hutong neighborhood that occupies a strategic position to the northeast of the Forbidden City, to Jiuxianqiao located between the fourth and fifth ring roads, and finally Xiaopu Art Village which occupies the farthest coordinates from the city center that is beyond the sixth ring road (Figure 1).

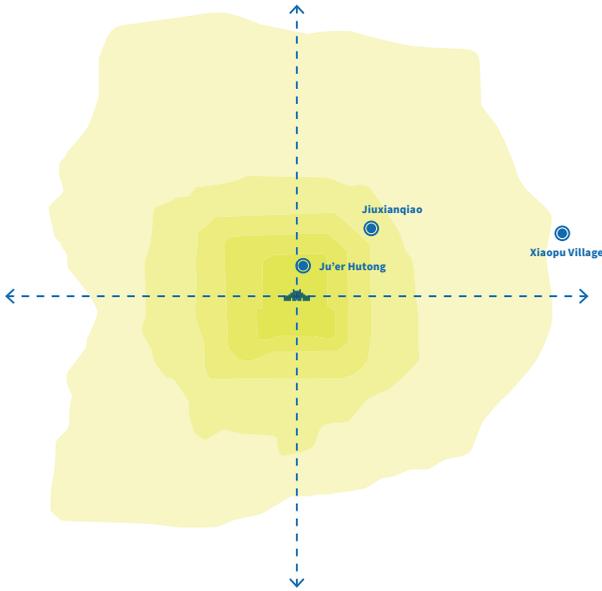


Figure 1. Geographical location of the case studies in the capital city Beijing. Credit: © Badiia Hamama.

3.1.1. Preserving Identity of Places in the Face of Profit-Oriented Strategies—The Ju'er Hutong Case

The Ju'er Hutong dating to the Yuan dynasty is located to the northeast of the Forbidden City in the famous Nanluoguxiang neighborhood, a protected historical area of the Old City of Beijing. Like many historical dwellings in the city center in the late 1980s, it was in a state of deterioration and decay. In 1989, the Dongcheng District (Wu 1999) selected it as an experimental site for renewal after repeated calls by many researchers to opt for a “metabolic change rather than total clearance and rebuilding” in traditional residential neighborhoods (Rowe and Kan 2014). The winning project designed by the architect Wu Liangyong was inspired by the so-called “organic” renewal concept. The main goal of this approach was to minimize the demolition of existing buildings through the repair of average-quality dwellings and the replacement of the dilapidated ones with new courtyard houses, which consisted

in borrowing traditional architectural styles and adapting them to accommodate the New Siheyuan concept, i.e., new courtyard prototypes mimicking the enclosed physical form of traditional neighborhoods (Figure 2).



Figure 2. View of Ju'er Hutong project after completion. Credit: © School of Architecture, Tsinghua University, used with permission.

The project was widely celebrated by the Beijing Municipal Government as a successful example of urban renewal. The success of the Ju'er Hutong was also associated with the close collaboration between government authorities, academic institutions, and the general public. The implementation of the rehabilitation plan was facilitated by a close collaboration between the residents, the designers and decision makers (Wu 1999). The housing renewal experiment of Ju'er Hutong project, which is only one part of the 8.2 hectare Ju'er Hutong neighborhood, was subdivided into four phases of development. Phase one was completed in 1990 and phase two in 1994 (Wu 1999, Figure 3). The proposed phases three and four were not implemented due to “the rising land value, the loss of government subsidies, and the developers’ concern about a lack of profit” (Zhang 2016).

The neighborhood, characterized by an intimate, close relationship between indoor and outdoor spaces, was ambitiously designed to improve the residents’ living standards and revive traditional community life. In addition, a strong spirit of communal identity and sense of belonging was fostered by the soft separation and hierarchy between the different spatial scales—public, semi-public, private—and reintegration of the urban morphology and space-making system of traditional neighborhoods. By adopting this metabolic urban redevelopment process, Wu prevented the complete replacement of the 8.2 hectare area at a time when the importance of traditional neighborhoods and the need to preserve the identity and

spirit of places were suffocated by a priority for economic profit. Nevertheless, the outcomes of the project, as explained by the architect Wu Liangyong (Wu 1999), have been negatively influenced by the pressure to raise the floor-area ratio (FAR), resulting in a far from ideal form. The size of the courtyards has been considerably decreased, compared to the classical Beijing’s *siheyuan*, in order to achieve larger private spaces equipped with modern facilities.

Built almost three decades ago, the Ju’er Hutong project still provides interesting evidence of the complicated task of balancing socio-spatial and economic factors in many urban (re)development projects in historical neighborhoods in China, where strongly interlinked political and economic interests have caused the paralysis, if not the failure, of several urban renewal projects. Ambitiously designed to improve the residents’ living standards and revive traditional community life, the Ju’er Hutong represented an important achievement in face of the many challenges that encountered the preservation of historical neighborhoods in post-industrial China, particularly due to the increasing land value that is still threatening the most representative housing forms of Beijing’s historical urban layout.

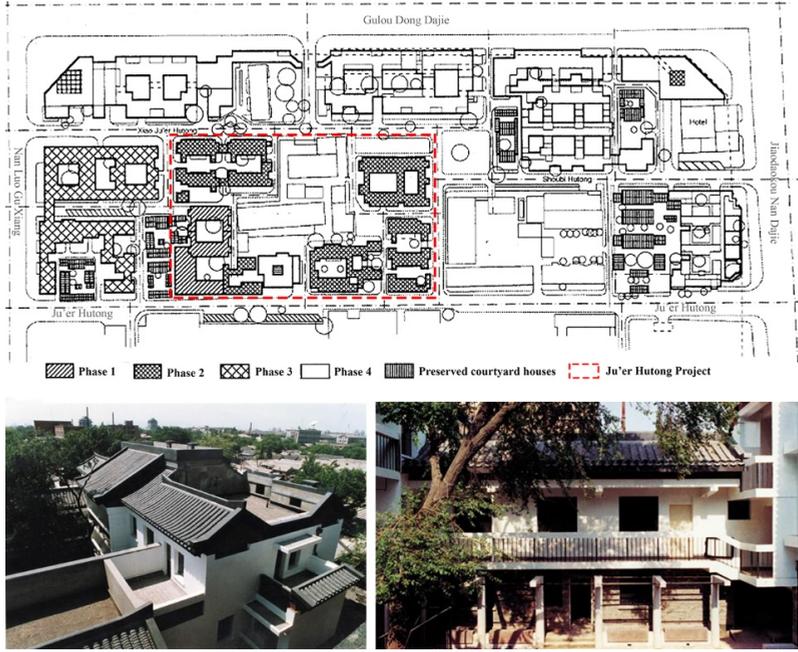


Figure 3. The phases of development of the entire Ju’er Hutong block and two detailed views of the courtyard houses of the completed project. Credit: © School of Architecture, Tsinghua University—edited by Badiia Hamama, used with permission.

3.1.2. Grassroots Mobilization and Its Role in Reversing an Exclusively Top-Down Urban (Re)Development Plan—Jiuxianqiao Residential District

Located in the north-eastern part of Beijing, Chaoyang district, Jiuxianqiao underwent a strenuous up-down period of urban redevelopment, which is still today at the center of negotiations and debates. Representing a typical *danwei* or work unit compound, Jiuxianqiao was built in the 1950s during the socialist period as the first center for the electronics industry. As all the work units of the industrial period, Jiuxianqiao was a self-contained urban unit combining workplace, residences, public services and facilities. Due to the radical changes occurred in the transition to the post-industrial period, Jiuxianqiao area experienced significant social and spatial transformations. In the new fast changing post-industrial environment, the work-units, representing the fundamental socio-spatial urban parcel of the socialist Chinese city, had gradually declined. As a consequence of the shift from housing as a welfare good to housing as a commodity product in the late 1990s and the necessity to redevelop urban land for more profit and rapid growth, the physical environment of Jiuxianqiao's former factories was upgraded and developed into profitable high-quality residences and offices, while the low-quality dilapidated housing left from the socialist period remained untouched (Figure 4). Following the development of new commercial housing, the original residents started their protests demanding for better living conditions (He 2010). Resistance and pressure exercised by the local communities resulted in an inverted perspective of community engagement in a predominantly top-down system (*ibid.*).

Effectively, the redevelopment plan of Jiuxianqiao, launched in 2004 by Beijing Municipal Government and Chaoyang District Government in partnership with private developers, was based on a top-down strategy that did not take into account the inclusion of the local communities in the decision-making process. After long negotiations, the local government and private developers decided to (re)develop Jiuxianqiao into high-quality and affordable housing with public facilities. Nonetheless, in 2008, the variation of the conditions for the urban regeneration plan to the detriment of the residents, particularly the reduction of the compensation packages, resulted in a stronger wave of discontent and protests amongst the dissatisfied local residents. To maintain the stability of the area and avoid the escalation of social conflicts, the local government was forced to organize a public vote to include the local community in the negotiation process for compensations (Zhang et al. 2016). The negative results of the vote led to the suspension of the redevelopment project and withdrawal of the chief private developer.

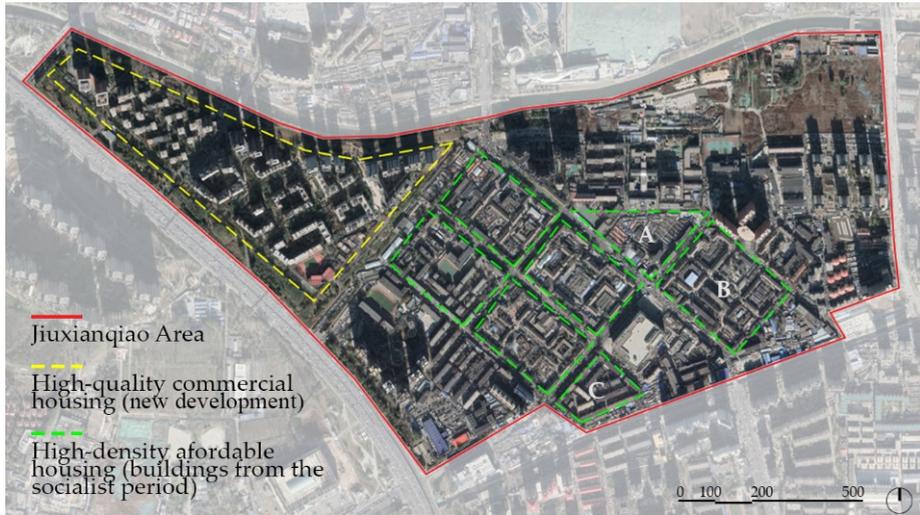


Figure 4. Satellite map with the typology of residential blocks composing Jiuxianqiao area. Credit: © Google Earth, 2020; illustrated by Badiaa Hamama.

In 2010, Chaoyang District Government decided to resume the redevelopment project adopting a more “transparent” compensation process, which consisted in the agreement that redevelopment could proceed only in those blocks, which compensation rates had been voted in favor by more than 90% of the local residents (*ibid*). These important grassroots mobilizations allowed the residents to potentially stand against colluding parties, acquiring the important role of being part of the decision-making process (Zhang 2002) and the negotiation for compensations. To date, and according to the author’s last investigation, only the blocks A, B and C had been renovated (see Figure 4 above), while the remaining high-density socialist blocks, the legacy of an industrial era, are still in the throes of an ongoing negotiation process witnessing the challenges to balance both economic and social factors in the process of physical transformation of pre-existing urban spaces in post-industrial China (Figure 5).



Figure 5. Jiuxianqiao’s traditional neighborhoods in contrast with the new commercial high-rise developments in the background. Credit: © Badiia Hamama, 2018.

3.1.3. From a Village Dedicated to Agriculture to a Global Center for Contemporary Art—The Case of Xiaopu Art Village

Different from the urban reality of Ju’er Hutong and Jiuxianqiao, Xiaopu Art Village, headquarter of Songzhuang town in Tongzhou District located in the eastern suburbs of Beijing, is a demonstrative case of China’s increasing interest in the urbanization of suburban areas and the promotion of culture and creative industries in post-industrial period. This case, among others in China, witnesses the process of a rapid physical and social transformation from a village initially intended to be an independent and organic center of art away from the government spotlight, to a catalyst for economic growth with a strong government intervention and control. It was not until the year 2000 that Chinese authorities started to promote culture and creative industries in an attempt to revitalize the economy and promote Chinese culture (Kean 2007). In the early 1990s artists’ communities were continuously persecuted and displaced due to various reasons in the country. Yuanmingyuan Village, one of the earliest artists’ villages established in the mid-eighties by a community of artists in Beijing was demolished in 1995 and its artists evicted to make way for the development of a villa project.

The displaced community of artists identified Xiaopu Village as their new ideal headquarter because it offered big, available, cheap-to-rent space, the relatively more relaxed atmosphere of rural areas, and was close to the city (Wang 2010). However, even before the new community of artists could be integrated their arrival in Xiaopu village was seen as a threat to public safety. In 1997, Tongzhou listed Xiaopu as one of the most dangerous public security hotspots in the district (ibid). Nevertheless, due to the State's growing interest in the creative industry, the activities of the new community of artists were soon considered as a source of revenue and economic revitalization. Xiaopu village, originally dedicated to agriculture, entered a process of spatial and social transformation into a national and global center for contemporary art by the local authorities of Songzhuang town in 2006 (Ren and Sun 2012). The local government's plan was to increase revenue through alternative land use, which resulted consequently in converting land from collective ownership of the villagers to public ownership under the direct control of the town government (Zhang 2014, Figure 6).

The origins of Xiaopu art village were rooted in a desire to create an autonomous community of artists and form an independent space for creativity and a certain lifestyle. Notwithstanding, its rapid institutionalization, commercialization and urbanization transformed the village from a self-governed artists' community into an officially recognized art establishment and economic growth engine. The unsustainable development approaches that transformed Xiaopu village from a forgotten and underdeveloped suburban area into an industrial cluster, meant primarily for economic gain, led to the displacement of several pioneer artists due to the pressure of urban development and the considerable rise in renting prices (Zhang 2014). It also caused the urbanization of local villagers following the transformation of their vocation from farmers to the staff of art and service activities (Figure 7).



Figure 6. Satellite maps showing the rapid transformation of Xiaopu village. Credit: © Google Earth, 2020; illustrated by Badiaa Hamama.



Figure 7. A villager on his moped looking at a construction site in Xiaopu village. Credit: © Liu Jian, 2012. Used with permission.

3.2. *The Restructuring of Italian Post-Industrial Cities: Adaptive Reuse Strategies to Design a New Image of the City*

In recent decades, the process of deindustrialization or production change, which has affected Italian and other European cities with a long industrial tradition, has generated strong repercussions on various manufacturing sectors, with negative impacts in socio-economic terms. The advent of the post-industrial transition phase

led city leaders and decision makers to agree that industrial cities could only recover if they promoted new lifestyles and sustainable working models in order to achieve new economic competitiveness and urban quality. In this context, urban policies and strategies recognize obsolete manufacturing sites as the most suitable place to land new urban visions, combining the legacy of the past with the desire for a new sustainable and socially integrative environment.

Culture and creativity played a crucial role in the transition to a post-industrial economy. They stimulated economic and urban growth, not only as a way to attract investments, but also as an effective tool to spark urban regeneration and economic and social innovation (Bianchini and Parkinson 1993). This process was backed by cultural policies that triggered competition between cities based on investments in cultural and creative industries and led to the formation of cultural districts. This topic was extensively debated and tested not only in Italy due to the typical district model of its productive fabric (e.g., the city of Prato, the “exemplary case of Italy of districts” (Becattini 2000), discussed below), but also in the scientific literature in the Western world and in China (e.g., the case of Xiaopu Art Village, discussed before).

This sparked growing interest in *adaptive reuse* design strategies to actively preserve physical and cultural heritage as well as disused buildings and industrial sites (Carter 2016; Wong 2016; Baum and Christiaanse 2012; Brooker and Stone 2004). Authorities and government agencies in several countries, not only in Europe, were fully aware of the impact of this transformation strategy. As a result, they promoted practices involving the adaptive reuse of existing buildings as a pragmatic tool in their urban programs. The goal was to foster the recycled use of land resources, the creation of a new city image, sustainable development, and to strengthen the sense of local identity of their communities. The growing number of design experiences in different contexts demonstrates the widespread use of this transformation strategy (obviously with some basic differences dictated by local conditions) due to the fact it triggers real estate valorization strategies by reinventing important urban areas.

Recycled industrial spaces are seen as potential resources to gradually increase infrastructure and services in the urban fabric and build a new alliance between the territory and different local societies (Ciorra and Marini 2011; Russo 1998; Secchi and Boeri 1990). The complexity of regeneration processes, the difficulty of adapting large unused spaces to the new socio-economic needs in old cities, and the long time frame needed for the municipal administration to actively involve communities determine a heterogeneous range of outcomes, as emerges from the case studies in the cities of Prato and Turin, illustrated in the following sub-sections. In the *Macrolotto 0* area in Prato, the re-use of former industrial structures in other manufacturing sectors or the vast panorama of cultural and creative industries proved to be an effective lever for engaging local stakeholders in the processes and procedures of cooperatively designing solutions. Within the rhetoric of reuse as new cultural and leisure spaces,

the “softer” approach experimented in Turin shows how the design results can effectively modify the pre-existing state of a site with minimal interventions but able to strengthen its historical and cultural values. Despite the different modes of intervention presented below, the main objective remains to protect and readapt physical heritage. In turn, this will preserve the historical and cultural memory of the city and its communities and ensure the long-term sustainable use of the building stock, often very different to the original.

3.2.1. A Public Participation and Co-Design Process to Achieve Social-Sustainable Integration—The Case of Macrolotto Creative District in Prato

In the second half of the twentieth century, a group of small and medium-sized enterprises (SMEs) in the textile sector in Prato created one of the major industrial districts in central Italy. In the past twenty years however, the district has witnessed important economic changes. Since the 1990s, the new industrial sector of the so-called *pronto moda* (apparel industry) has risen to 25% of local GDP (Lombardi and Sforzi 2016). The growth of this industry is closely linked not only to the Chinese community in Prato (the third largest in Europe), but also to transnational Chinese networks across Europe (Lan and Zhu 2014). The new community developed a new production model by reusing abandoned structures in the so-called *Macrolotti* areas, as called by the urban planner Bernardo Secchi in 1996, during the drafting of the City’s Masterplan. In particular, the consolidated urban area spreading westward from the old city walls has been called *Macrolotto 0* (Figure 8).

Macrolotto 0 was once the driving force behind the former industrial district of Prato but later became a predominantly Chinese neighborhood. However, over the years, complex relations between Italian and Chinese communities triggered growing social tensions (Lan 2015), as immigration was considered by local population as the main reason for the district decay (Nielsen et al. 2012). The Municipality of Prato decided to encourage a socially integrative transition in one of the most important neighborhoods for the future of the city, both in terms of its location and historical role. It resolved to include a public participation and co-design process, called *Prato al Futuro* (Prato looks to the future), in the draft of its new Operational Plan (urban development plan) adopted in September 2018. This planning tool was meant to collect and systematize what was to be included in the plans: projects, process interventions, and the outcome of the participatory process already activated by the local administration. During four months, from September to December 2017, the participatory process involved an extensive program of activities: from meetings with citizens to workshops for designers and professionals, as well as more recreational initiatives actively involving all citizens. The new Operational Plan integrates experience and expertise, addressing issues such as public space, reuse, ecology and the circular economy as a driver for change.



Figure 8. Macrolotto 0 area, Prato, Italy. Credit: © City of Prato 2019, used with permission.

As part of the overall framework of *Prato al Futuro*, the urban strategy redesigned *Macrolotto 0* as a creative district by using culture and creativity as tools to generate social inclusion between the Italian and Chinese communities. In the last few years, there has been an increase in initiatives involving active citizenship and specific transformation. One such initiative is the *Piazza dell'Immaginario* organized by Dryphoto Contemporary Art (2014, recently dismantled). In addition, numerous creative industries and local associations have slowly relocated to this neighborhood (Artforms, [chi-na], Circuito Urbano Temporaneo (CUT) - Temporary Urban Circuit, Kinkaleri_spazioK, Lottozero, Studio MDT, Sixteen, and Studio Court 17). The municipal government also developed a more ambitious project, called *Macrolotto Creative District* (2018) (Figure 9).

Covering an area of 44 hectares, its focus is the role of public space as the “urban backbone” of the regeneration and place making strategy. The project includes: the creation of a big new square; the transformation of former industrial structures in new spaces for aggregation and sociality; a metropolitan market; a media library; co-working spaces; sustainable mobility interventions such as the creation of a 30 km/h area; pedestrian and cycle paths. The result is a network of public and private spaces and welfare services, diffuse and connected to existing paths and structures,

forming a spatial *continuum* that renews the dense city and extends into the open spaces. The core strength of the creative district is the combination of urban life, social inclusion, and quality standards which together create a vibrant urban niche. As a result, many interventions focus on the relationship between the new creative community and the immediate neighborhood as a way to support social cohesion and dynamic activities.



Figure 9. Macrolotto Creative District, Prato, Italy. Credit: © City of Prato 2020, used with permission.

3.2.2. The “Adaptive Reuse” Strategy to Create New Urban Centralities and Enhance Socio-Spatial Identity—The Turin Approach

In recent decades, the city of Turin has been undergoing a process of transition towards the definition of an urban development model able to complement its traditional industrial specialization. Up until the eighties, the automobile industry was the driving force behind the economies of the city and the lifestyle of its citizens, fueling its image as the most important company town in Italy. From the fifties onwards, wave after wave of domestic migration towards the city, especially from the southern regions of the country, has transformed its social and urban structure. After each difficult crisis in the automobile industry, the city tried to project new images: initially in the nineties with urban renewal projects, then with the Olympic city (in

the frame of XX Winter Games Torino 2006), and finally by launching a “smart”, tourist-oriented and University city.

Compared to other situations in Italy, Turin’s adaptive reuse of the spaces left by its industrial legacy reveals its unusual, “soft” approach. Rather than enlarging the city, the refurbished sites become part of its mainstream activities: selective addition and substitution interventions transforming the urban fabric thanks to “re-sewing” processes that create new, dense and vital urban centralities (Vassallo 2017). The goal is to preserve and reactivate the city’s tangible and intangible heritage since the latter fosters community building and local identity. Different forms of such “re-sewing” process exist in the city (Vassallo 2017): renovation of former factories (e.g., the Lingotto, a former FIAT factory); renewal of the urban fabric (e.g., the Spina 3 urban area); and urban regeneration projects to reintroduce industrial production in disused spaces (e.g., Mirafiori, a former FIAT factory). Regeneration is an effective way to re-employ available structures, but above all, it compacts the city by reducing the consumption of space, time and energy. Parco Dora in Spina 3 (Figure 10), for example, provides a new understanding of inner urban landscapes and reflects the current transition taking place in society.

The new park was created by converting 37 hectares of a former industrial complex located in a strategic redevelopment area called Spina 3. The factories, active until the nineties, used the Dora river for their manufacturing processes. Parco Dora is an emblematic example of preservation of iconic structures, charged with symbolic values and re-functionalized as a large flexible infrastructure to service the local community. The goal of the project by Latz+Partner and others (2004–2012) was to incorporate and enhance the identity of each of the five zones in the park in order to enrich the park experience. Visitors can use the network of pedestrian paths, bridges, steps and ramps that connect the various areas and surrounding neighborhoods and run past several ruins partially covered by vegetation (Bullivant 2008). An open community program is also held in the park, with sports, cultural, temporary and international events. The industrial skeletons are thus transformed into an immense stage set for the public life of the city. The Parco Dora intervention demonstrated that the crucial factors required to create “well-being” for urban communities are quality physical space and the relationship between the design of the built environment and urban lifestyles.



Figure 10. Parco Dora, Torino, Italy. Credit: © Latz+Partner 2012, used with permission.

4. Discussion and Conclusions

The transition from an industrial environment to a post-industrial (re)development era in both China and Italy has been driven by a multitude of complex dynamics at the economic, social and spatial levels. In this manuscript, the authors attempted to focus particularly on the factors and the main events that have influenced the physical and social transformation of cities in a climate of rapid change and new expectations. With the help of case studies, we shed light on some of the transformative strategies and challenges of post-industrial restructuring in both the Chinese and Italian contexts.

In China, two important events have reshaped the socio-spatial structure of its cities: land and housing marketization, respectively, in the late 1980s and 1990s under the circumstance of rapid urbanization. The flourishing new market forces and fast growth of the real estate industry set off an unprecedented competition for urban land. In most cases, it caused the demolition of millions of square meters of traditional residential districts and old neighborhoods (chiefly located in city centers) to make room for more profitable modern high-rise buildings (Hsing 2010). In Beijing, several policies have been implemented to encourage tertiary industries and thereby transform urban industrial infrastructures. The city center, occupied mainly by typical low-rise traditional courtyard houses, became a hotbed for real estate development projects, causing irreversible damage to the city's socio-spatial structure and identity (Abramson 2001). The nonstop wave of demolitions triggered fierce debates amongst architects and urban planners calling for the protection of

traditional neighborhoods. Several projects were rebuilt based on the philosophy of “repair the old and make it look old” (修旧如旧—xiu jiu ru jiu); nevertheless, this redevelopment approach often involved the demolition of traditional urban structures and the construction of new urban development (Lu 1997), with a few exceptions, such as the case of Ju’er Hutong, where architect Wu adopted the concept of organic renewal, trying to maintain as much as possible of the historical dwellings.

Similar to the approach of “organic renewal”, experimented in Beijing, is the process of “re-sewing” tested in the city of Turin, which demonstrated how design results can effectively modify the pre-existing state of a site with minimal interventions but capable of reinforcing its historical and cultural values. Just as in China, in Italy, the process of de-industrialization and the changes in the modes of production have triggered a profound re-articulation of the relationship between economy, territory and society. In this transitional phase, cities contributed to the promotion of new lifestyles and sustainable development models to achieve a new economic competitiveness and a higher quality of urban environment. In this context, municipal authorities promoted, on the one hand, the implementation of policies and strategies focused on culture and creativity and, on the other hand, territorial marketing operations that exploit the renovation of obsolete industrial structures to define a new image of the city. Consequently, urban regeneration and the reuse of existing building stock has become one of the most debated topics.

Aside the different terminologies, e.g., organic renewal, adaptive reuse, re-sewing, and (re)development strategies etc., what emerged in both China and Italy is a new sensitivity towards the practices of preservation and reinvention of the pre-existing industrial urban fabric, in an attempt to protect the physical heritage and the identity of urban spaces, as well as an alternative tendency to engage the local communities as an integral part of the decision-making process. Civic engagement proved to be an essential prerequisite for the implementation of the plans of urban regeneration as shown in the Ju’er Hutong project and Jiuxianqiao, even if in the latter case community participation was triggered by grassroots mobilization. In Italy, the case of *Macrolotto Creative District* shows how virtuous processes and practices, ascribable to the creative and cultural economy, are even more effective in terms of social integration when they involve the local community in the co-design of spaces. Both in China and Italy, cultural and creative industries started to play a vital role in the reinvention of post-industrial cities and economic regeneration. Adaptive reuse of existing industrial structures for new functions better designed to meet the needs of a contemporary environment and the recycling of abandoned production sites, as in the cases of Prato and Turin, became a widespread transformation strategy in Italy. In China, cultural and creative industries, as demonstrated through the case of Xiaopu Art Village, had been pointed as a driver for economic growth and urban development in the peripheral zones. Nevertheless, the emergence of independent

and organic art villages in the suburban areas by autonomous communities of artists had been later institutionalized through top-down government interventions, which finally resulted in the displacement of the pioneer artists due to an increase in real estate prices.

Generally, the Chinese post-industrial (re)development processes have been shaped by an overemphasis on economic growth and on top-down interventions over community building and social integration. However, lately perspectives are changing and alternative approaches to urban (re)development, with more social inclusion, thanks also to grassroots mobilization, are in the making in the Chinese urban context. Regardless, more effort, political will, and people-centered approaches are needed to better tackle the socio-spatial consequence of urban and rural redevelopment, protecting and guaranteeing the interests of the most vulnerable.

The Chinese and Italian post-industrial experiences were undoubtedly shaped by different driving forces at the economic, social and spatial levels, and adopted various approaches and strategies to tackle the new challenges. However, it emerges that the two realities identified some factors as essential for a successful and sustainable transformation of the urban spaces: the preservation of the physical heritage and identity of a place and the involvement of local communities. Nevertheless, achieving socially integrative cities is still an arduous task in both China and Italy. The following recommendations are valid for both urban contexts as driving elements for future interventions: assure more active participation and civic engagement focusing on co-design processes to better address the needs of the local communities and preserve the specific features of places; involve the public through community events, cultural and artistic festivals, local markets, etc.; make the construction of public support the key factor for the (re)development of urban and rural areas. From the point of view of policy makers, it is important to give a relevant role to urban adaptive reuse in the general vision of a city, because of the possibility of citizens' deep involvement, temporary and quick measurable results.

Author Contributions: Conceptualization, B.H., M.P.R., J.L. and M.B.; Methodology, B.H., M.P.R., J.L. and M.B.; Investigation, B.H., M.P.R., J.L. and M.B.; Data Curation, B.H. and M.P.R.; Writing—Original Draft Preparation, B.H. and M.P.R.; Writing—Review and Editing, B.H., M.P.R., J.L. and M.B.; Supervision, M.B. and J.L. All authors have read and agreed to the published version of the manuscript.

Acknowledgments: The authors are thankful to the anonymous reviewers for their insights and suggestions.

Conflicts of Interest: The authors declare no conflict of interest. The founding sponsors had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, and in the decision to publish the results.

References

- Abramson, Daniel. 2001. Beijing's Preservation Policy and the Fate of the Siheyuan. Traditional Dwellings and Settlements Review. *Journal of the International Association for the Study of Traditional Environments* 13: 7–22.
- Baum, Martina, and Kees Christiaanse. 2012. *City as Loft: Adaptive Reuse as a Resource for Sustainable Urban Development*. Zurich: gta Verlag.
- Becattini, Giacomo. 2000. *Il bruco e la farfalla: Prato nel mondo che cambia, 1954–1993*. Firenze: Le Monnier.
- Bianchini, Franco, and Michael Parkinson. 1993. *Cultural Policy and Urban Regeneration: The West European Experience*. Manchester: Manchester University Press.
- Bonino, Michele, and Filippo De Pieri. 2015. *Beijing Danwei. Industrial Heritage and the Contemporary City*. Berlin: Jovis.
- Brooker, Graeme, and Sally Stone. 2004. *Re-Readings: Interior Architecture and the Design Principles of Remodelling Existing Buildings*. London: RIBA Enterprises.
- Bullivant, Lucy. 2008. Technology and Nature find their "Entente Cordiale" Through a New Urban Synergy: Latz + Partners' Parco Dora, Turin and Duisburg Nord Landscape Park, Germany. *A+U-Architecture and Urbanism* 455: 140–43.
- Carter, Donald K. 2016. *Remaking Post-Industrial Cities: Lessons from North America and Europe*. New York: Routledge.
- Ciorra, Pippo, and Sara Marini, eds. 2011. *Re-Cycle: Strategie per l'architettura, la città e il Pianeta*. Milano: Electa.
- Florida, Richard. 2002. *The Rise of the Creative Class*. New York: Basic Books.
- Gaubatz, Piper Rae. 1995. Urban Transformation in Post-Mao China: Impacts of the Reform Era on China's Urban Form. In *Urban Spaces in Contemporary China: The Potential for Autonomy and Community in Post-Mao China*. Edited by Deborah S. Davis, Richard Kraus and Barry Naughton. Cambridge: Cambridge University Press.
- Hamama, Badiia, Maria Paola Repellino, Jian Liu, and Michele Bonino. 2019. The process behind community building and place making in transitional urban moments: A comparison between China and Italy. *China City Planning Review* 28: 25–34.
- He, Jun. 2010. Public Participation in the Perspective on the Expression and Integration of Interests: An Analysis on the Case of "Voting on Demolition and Relocation" in Beijing Jiuxianqiao. *Journal of Beijing Administrative College* 2010: 89–94.
- Howkins, John. 2001. *The Creative Economy: How People Make Money from Ideas*. London: The Penguin Group.
- Hsing, You-tien. 2010. *The Great Urban Transformation: Politics of Land and Property in China*. New York: Oxford University Press.
- Kean, Michael. 2007. *Created in China: The Great New Leap Forward*. Curzon and London: Routledge. [CrossRef]
- Lan, Tu, and Shengjun Zhu. 2014. Chinese Apparel Value Chains in Europe: Low-end Fast Fashion, Regionalization, and Transnational Entrepreneurship in Prato, Italy. *Eurasian Geography and Economics* 55: 156–74. [CrossRef]
- Lan, Tu. 2015. Industrial District and the Multiplication of Labour: The Chinese Apparel Industry in Prato, Italy. *Antipode* 47: 158–78. [CrossRef]

- Liu, Jian. 2019. Influence of Planning Policy on Community Shaping in China: From Past to Present. *China City Planning Review* 28: 18–29.
- Lombardi, Silvia, and Fabio Sforzi. 2016. Chinese Manufacturing Entrepreneurship Capital: Evidence from Italian Industrial Districts. *European Planning Studies* 24: 1118–32. [CrossRef]
- Lu, Junhua. 1997. Beijing's Old and Dilapidated Housing Renewal. *Cities* 14: 59–69.
- Ma, Laurence J. C., and Fulong Wu. 2005. *Restructuring the Chinese City Changing Society, Economy and Space*. New York: Routledge.
- Mars, Neville, and Adrian Hornsby. 2008. *The Chinese Dream: A Society under Construction*. Rotterdam: 010 Publishers.
- Nielsen, Ingrid, Olga Paritski, and Russell Smyth. 2012. A minority-status perspective on intergroup relations: A study of an ethnic Chinese population in a small Italian town. *Urban Studies* 49: 307–18. [CrossRef]
- Ren, Xufei, and Meng Sun. 2012. Artistic urbanization: Creative Industries and Creative Control in Beijing. *International Journal of Urban and Regional Research* 36: 504–21. [CrossRef]
- Rowe, Peter G., and Har Ye Kan. 2014. *Urban Intensities Contemporary Housing Types and Territories*. Berlin: Birkhäuser.
- Russo, Michelangelo. 1998. *Aree dismesse: forma e risorsa della "città esistente"*. Napoli: Edizioni scientifiche italiane.
- Secchi, Bernardo, and Stefano Boeri. 1990. I territori abbandonati. *Rassegna* 42: 4–89.
- Vassallo, Ianira. 2017. Torino. Rileggere oggi la città fordista. *Territorio* 81: 81–85. [CrossRef]
- Wang, Meiqin. 2010. Art, Culture industry and the Transformation of Songzhuang Artist Village. *The International Journal of the Arts in Society* 5: 1. [CrossRef]
- Wang, Ya Ping, and Alan Murie. 1999. Commercial housing development in urban China. *Urban Studies* 36: 1475–94. [CrossRef] [PubMed]
- Wong, Liliane. 2016. *Adaptive Reuse: Extending the Lives of Buildings*. Basel: Birkhäuser.
- Wu, Liangyong. 1999. *Rehabilitating the Old City of Beijing. A Project in the Ju'er Hutong Neighborhood*. Vancouver: UBC Press.
- Zhang, Donia. 2016. Juer Hutong new courtyard housing in Beijing. A review from the residents' perspective. *Archnet-International Journal of Architecture Research* 10: 166–91. [CrossRef]
- Zhang, Lei, Jing Chen, and Rachel Tochen M. 2016. Shifts in Governance Modes in Urban Redevelopment: A Case Study of Beijing's Jiuxianqiao Area. *Cities* 53: 61–69. [CrossRef]
- Zhang, Tingwei. 2002. Urban development and a socialist pro-growth coalition in Shanghai. *Urban Affairs Review* 37: 475–99. [CrossRef]
- Zhang, Yue. 2014. Governing Art Districts: State Control and Cultural Production in Contemporary China. *The China Quarterly* 219: 827–48. [CrossRef]

Looking at Socially Integrative Cities through the Educating City: The Example of Educational Museums in Europe and China

Fabrizio d’Aniello, Zhuqing Xu, Elisabetta Patrizi and Stefano Polenta

1. Introduction: The Educating City

The concept of the educating city is particularly functional to the Trans-Urban EU-China project, to the transition to socially integrated cities and to the pedagogical objectives that this transition suggests. The construction of a socially integrative city (inclusive, cohesive and livable) also depends on the efforts made to enhance the strengthening of the sense of community by means of a proactive education capable of developing a socio-cultural dimension and social capital, as highlighted in Chapter 2 of this book and underlined by Müller et al. (2019). The beating heart of the concept of the educating city refers indeed to the ability of the city to become an educating (and self-educating) “community” and a place of significant social relationships, aimed at harmonizing different people and behaviors and stimulating mutual recognition and respect, symbolic identification, expression and integration of cultures and social inclusion (see Bertolini 1989; Borello 1989; Borja 1998; Perucca 2007; as well as the publications edited by the International Association of Educating Cities—IAEC: Bauman 2008; del Pozo 2008; Lipovetsky 2017; Tarabini 2017). In short, thanks to the educating city/community, we can better understand the role of “education” and community educational networks in sustainable urban development, their influence in strengthening the social fabric and their importance in promoting social harmony and unity.

Given the above, an educating city is a city that is capable of involving its inhabitants in educationally relevant interactive dynamics and in a continuous learning and educational process, transversal to all ages of life (Fernando and Morell 1990; Bosch 2008). This involvement allows individuals to grow, expanding their opportunities for improvement and increasing their possibilities of achieving self-realization objectives. At the same time, it allows the city itself to develop its own evolutionary potential, taking advantage of the activated educational-relational paths and widespread accessibility to learning (Piazza 2013; Angori 2016). It is therefore a win-win situation, in which the positive implications for both parties not only relate to the demands for economic progress in general, but also to those for humanization, aiming at the full maturation of people. In this perspective, the educating city integrates school and university education, extending and enhancing its educational, cultural and informational offer; it harmonizes different educational and training actors and institutions of the territory; and it places

a high value on the non-formal and informal dimension of “education” and learning. Furthermore, it makes a pedagogical reflection on its own spaces, with the objective of designing or making them available in order to satisfy the educational and relational needs of citizens (Frabboni 1990, 2006; Trilla Bernet 2005; Bosch 2008; Llop Torné 2009).

The aforementioned purposes were clearly highlighted at the time when the educating city became a prominent topic within the pedagogical landscape, referring, for example, both to the hypothesis of building an integrated educational system, aimed at making the city a great “educational laboratory” (Frabboni 1991, p. 35), and to a necessary alliance between pedagogy, urban planning and architecture (Gennari 1989), starting from the conscious need to assign educational meaning also to the “signs” that constitute the “urban texts” (Gennari 1995).

The current international notion of the educating city still embodies these purposes. However, the reference paradigm has changed over the last thirty years (from lifelong education to lifelong learning), in favor of a prevailing attention to economic outcomes of educational processes and of a substantially efficiency-based view of learning (Barros 2013). Furthermore, the terminology has also changed, to the extent that our original expression is now accompanied by the concept of the learning city (Longworth 2006). However, the number of contributions calling for the return to purely educational origins, for a dissociation of the learning city from such a limited perspective, and for the resurrection of an ethical and humanistic approach to learning (Osborne et al. 2013), which would continue to represent the city as a privileged place of encounter between educational concerns and democratic instances of human development (UNESCO 2014), is not negligible. In this respect, we cannot but think of Dewey (1940) and the relationship between education and democracy based on the concept of “community education”; and, even before Dewey, of the Greek “polis”, where the “paideia” consisted basically in the rulers’ capability to use education to form responsible individuals, able to provide for their own prosperity and to ensure the democratic prosperity of the community (Ortega Esteban 1990; Trilla Bernet 2005; Angori 2016).

The democratic yearning, therefore, has not vanished with the learning city, especially when the emphasis is placed on the beneficial effects of learning on the promotion of active citizenship, increasing participation in political and social life, personal and community well-being, social cohesion and the ability to react to sudden global changes (Longworth and Osborne 2010). In addition, it is particularly evident when the fulcrum of a learning city is identified in learning as an expression of a shared culture (Piazza 2015). Once again in line with Dewey (1916), the actualization of each person’s potential (education as *ex ducere*), conceived as the ultimate meaning of democracy, is closely related to social efficiency determined by the possibility of cultivating values together through education, i.e., of structuring a shared culture from the bottom. However, if the literature on learning cities tries to rebalance

the relationships at stake, the educating city has never lost its democratic input, remaining faithful to its genetic matrix, dating back to the 1970s: the paradigm of lifelong education (Meirieu 2008). Through the concepts of “educating community” or “*cit  educative*” (UNESCO 1972), this paradigm does not revolve primarily around economic goals, but it rather aims to nourish people’s critical and creative thinking, support the coexistence of differences and counter any form of alienation of the human potential through the total education of all and, for these reasons, it presents an explicit democratic dimension (Mencarelli 1964; Lengrand 1965, 1970; Lorenzetto 1976; Cropley 1979; Suchodolski 1992; Schwartz et al. 2009). This is why, in this paper, in order to mark a pedagogical distance from the functionalist drifts of the lifelong learning paradigm, we will continue to prefer and use the term educating city, embracing the genuinely educational and democratic spirit that animates the guiding idea of lifelong education.

With this, we do not want to state that the economic objectives must be excluded from the educating city, but that the community dimension (*cum munus*) should be the prevailing one: economic competition needs an educational perspective which places the participatory and relational sphere at the center, in order not to reduce the infinite potential of every human being to become an “economic agent”, generating conflict between persons and peoples. Comparison and mutual understanding contribute, in fact, to the creation of richer personalities and a more integrated “social being”, without mortifying everyone’s differences and peculiarities.

Methodologically, the article adopts a critical-argumentative approach and examines two cases of educational museums (one in China and one in Europe), in which the typical ideal of the educating city has declined from two different perspectives: the first one being more linked to the participatory dimension of knowledge (Europe); the other one being more linked to the dissemination of knowledge as a strategic element of the “learning society” (China). These different instances can and must find an integration, as will be explored in the conclusions.

2. The Educational Vocation of Museums in Europe: The Example of School and Education Museums

We have seen how the prospect of an educating city intends to relaunch the city as a living space, with the expression of a community capable of experiencing itself as an active citizenship, which feeds its desire to know and communicate. If this is true, then it appears important to identify those poles of interest which allow expressing the educational potential of the city. In particular, we should enhance those institutions which, like museums, represent the collective memory of a community and can offer non-formal learning opportunities capable of reducing inequalities and reaching every social class in a welcoming and inclusive way (Gallina 2004). In this direction, museums can represent important places to foster

proactive education policies, to preserve cultural heritage and to foster social capital, i.e., to find out some strategic factors for a socially integrative city (Müller et al. 2019).

In recent years, museums have changed their role. For a long time, museums have been perceived and conceived as places of conservation for privileged people. This view began to change around the 1970s and 1980s thanks to the *Nouvelle Muséologie* movement. As it is well known, this movement, born in France and which soon spread throughout Europe and beyond, had the intention of eliminating the distance between museums and their users, investing museums with a key role in promoting the cultural and also economic development of a territory. In this way, museums became spaces for everyone without any kind of social or cultural distinction, places of cultural democratization and dynamic and interactive spaces capable of encouraging the emancipation of a community and the ability of its inhabitants to recognize themselves around a common heritage of knowledge and values as integral parts of their own collective identity (Maure 1996). This qualitative leap was theorized at the beginning of the seventies through the concept of the ecomuseum or community museum and gradually allowed shifting the attention of experts from the objects preserved in a museum to the experience that it allows to live (de Varine 2005; Beruglia et al. 2004). In this way, museums moved from the traditional passive function of preserving and displaying collections to that of presenting activities for visitors, capable of establishing new relationships between the user, the museum's heritage and their socio-cultural environment. Very interesting examples of this museological conception are the community museums of Mexico. These museums were instituted in the seventies and are considered living museums because their heritage is the result of a long process of dissemination, research and organization carried out by the members of the communities with the support of institutional advisors. Therefore, these community museums were conceived as a "meeting point" which «bring together the genuine concerns of the rural, urban, indigenous and racially-mixed communities of Mexico" (Yanes 2010, p. 25).

It cannot be denied that, in terms of results, there is still a lot to do to ensure that museums are conceived and perceived as places of everyone for everyone; however, we should recognize the *Nouvelle Muséologie* movement's merit of having opened a breach, capable of having people look at museums with "new eyes", including among their tasks also the educational one (Somoza Rodríguez 2013). Even today, there are "antiquated museums", which favor the conservative role and present themselves as temples reserved for a few selected people, but we must also observe the growth in the number of new-generation museums (recently founded or that have decided to change their vocation), which invest in education and aim to create increasingly dense and direct communication channels with the surrounding context (Hooper-Greenhill 2007).

Among the new-generation museums with a distinctly educational vocation, we can certainly include school and education museums. The heritage preserved in these museums is very different from that contained in other types of more widespread and well-known museums, such as art museums, as it has no market or esthetic value, but its value is contained in the complexity and richness of the social relations it evokes, all referable to the variegated world of educational relationships. These are museums that often arise from a private initiative of a voluntary nature or that take shape within university departments through the involvement of small groups of professors of history of education. To a lesser extent, these museums are set up with public funds, as part of a cultural or educational institution (Somoza Rodríguez 2013, pp. 152–53).

In order to follow the first traces of these museums, we must go back to the 1970s and 1980s, when the international movement of new educational museums spread to the countries of Northern and Central Europe, in the wake of *Nouvelle Muséologie*. The movement wanted to distance itself from the museum pedagogy of the nineteenth century, proposing a new type of museum, intended to enhance the historical educational heritage preserved in it (Carreño 2008).

When we speak of historical–educational heritage, we refer to a wide and varied typology of goods, which includes not only books and archival materials, but also material goods (e.g., school aids, school furniture elements, school buildings) and intangible goods (such as school-use costumes, values and practices). The lowest common denominator of these very different goods is the fact that they have been used and created for educational purposes (Meda 2013). Given their particular nature, school and education museums should be privileged places of interest for any city that aspires to be an educational city precisely because—if accompanied by adequate educational strategies—they allow users to evoke and relive an experience that unites many people regardless of age, gender and social status differences, i.e., a school.

In this regard, it may be useful to note that, even if we tend to speak about school and education museums as a single category, it should be specified that school museums retain assets preferentially linked to the school, while museums of education represent educational processes, which can also be carried out by other educational institutions. In addition, there are many different typologies of museums which aim to preserve and enhance the historical–educational heritage, such as childhood museums, museum schools, classroom museums, educational and/or scholastic museums and demo-ethno-anthropological museums, which often host reconstructions of ancient classrooms as evidence of one of the many facets of local culture.

Currently, school and education museums and related ones are well present in Europe; in fact, there are over 60 museums of this kind in Italy, 60 in Germany, 41 in France and 26 in Spain (Meda 2013, p. 512). At present, not all museums of historical–educational interest have proposed educational proposals. Many museums limit themselves to offering only conservation activities and guided tours conducted

by a few volunteers. In addition, in many school and education museums, there are reconstructions of classrooms of different periods, one next to the other, each one with its typical school aids, in a kind of linear and peaceful representation of the educational processes, which are far away from the real modality of education in the past (Yanes 2010; Somoza Rodríguez 2013). Nonetheless, we all know that the resources that these museums can express at an educational level are almost unlimited precisely because the educational aspect is connoted in their genetic heritage. Therefore, these museums have all the characteristics to qualify as places of meeting and comparison, capable of raising questions about social identities and differences of the most recent and more distant educational pasts (Brunelli 2018).

There are many projects which show the educational potentialities of school and education museums as factors of a socially integrative city and spaces for exchange of knowledge and the collectivization of learning (Ascenzi and Patrizi 2014, pp. 687–89). For example, we can recall the experience promoted by CEINCE (Centro Internacional de la Cultura Escolar) in Berlanga de Duero in 2009, in collaboration with the team of an association of family members of Alzheimer's patients in Soria (psychologists, doctors, therapists, social workers), during which activities were carried out to stimulate the memory residues of a group of Alzheimer's patients through sounds, images and objects related to their scholastic past. The educational context was recreated in the museum spaces of CEINCE and was structured starting from the materials preserved in it. The results obtained were appreciable both for individuals, who showed sensitive signs of recovering memories of their past, and for all the people involved in this experience, who were able to share their school memories in an intense moment of socialization (Escolano 2010).

This is just one of the many paths of enhancement of the heritage preserved in the school and education museums, which shows the real "profit" that can be obtained from cultural heritage in general, a profit far more important than the economic one because it affects the well-being of a community, activating channels which allow reaching even the weakest people. This example also shows how the task of the various social actors that animate a city, in particular the institutional ones, is to create the conditions for promoting the well-being of citizens, solidarity coexistence and active participation, moving from the cultural capital available to the community. In this way, we can achieve the deepest sense of "civitas" as an aggregation of citizens who contribute to mutual growth through projects and actions, which enhance the potential of the city as an educating community, which allows every citizen (regardless of age and level of learning) to perceive themselves as a learner, i.e., as a person capable of generating new knowledge and appreciating its benefits (Gennari 1995). If a community manages to work in this direction, discovering day after day that learning is not an individual but a collective fact and that "learning to learn" is the real capital of a city and the keystone of an effective

social integration, then we can confirm that the community has taken the main road of the educating city.

3. Creating More Inclusive Learning Spaces in China: Science and Technology Museums in China

Educational processes play an important role in socially integrative cities. Learning spaces such as museums can be treated as a part of the education function of educating cities. These were the focal points of the analysis conducted with respect to school and education museums in Europe. There is no research on these museums in China. However, there are other types of educational museums, i.e., science and technology museums, that can be considered as expressions of the philosophy of an educating city and, therefore, as tools for achieving social integration and inclusion.

The easier it is to access knowledge, the more you can participate in the inclusive society construction process, especially for the kids and people living in countries. In China, this kind of effort seems more important because of the serious regional development gap. Since the reform and opening in 1978, the eastern region benefited from policy preferences and market forces and entered a fast development tunnel. The share of the national GDP of the eastern region increased from 40% to 50% in two decades (Li and Huang 2020, p. 78). In contrast, the percentage of the national GDP of the central, western and northeastern regions dwindled. Furthermore, the fiscal spending per capita of the eastern region was the highest during 2000–2018, where the eastern region boasted the highest per capita spending on many public services, particularly education, science and technology and community services, and this created a significant regional education gap in China.

This gap not only exists in the possibility to access education but also in the quality of education. According to the China Compulsory Education Quality Monitoring Report in 2018, rural students lag behind urban students in their scientific inquiry ability. Most teachers do not know an effective way to improve the inquiry ability of students, school Science and Technology Information (STI) labs cannot provide useful and dynamic knowledge for students and the usage rate of school STI labs is quite low.

Considering such a background, the creation of more inclusive learning spaces is an important part of the construction of educating cities in China. The Science and Technology Museum project offers several ways to help. The Science and Technology Museum project began in the late 20th century and it was taken as a large-scale education and science popularization infrastructure to provide an inclusive learning space for people in different areas. The first science and technology (S&T) museum was established in Tianjin in 1995, and since then, numerous museums have sprung up in various Chinese provinces (Chen and Fang 2006). Most of these S&T museums act as science centers and learning spaces where education has a key role. Nowadays,

China has formed a modern S&T museum system of its own which can provide S&T resources and technical services to different regions and different groups of residents.

The modern S&T museum system can be divided into three levels. The first level is the physical science and technology museum, which is the traditional form of museum. These museums display the history of science and technology, creating S&T activities for the public to experience. In China, every province has its own S&T museum, and some of the big cities have also constructed an S&T museum and taken it as an important place for science education. At the end of 2014, there were 129 qualified S&T museums distributed in different regions. One of the most important ones is the China Science and Technology Museum in Beijing, which is located in Chaoyang district, near the main Olympic stadium.

Although S&T museums are becoming more and more accessible in China, they are still not enough for the huge number of inhabitants and considering the large regional scale. Another important S&T museum was born with the special mission to bridge the gap between remote and rural areas. In March 2016, China's State Council General Office launched "The Civic Scientific Literacy Action Implementation Plan" (2016–2020). This document emphasizes the need to improve the scientific literacy of the Chinese population. The China Science and Technology Association (China Science and Technology Association 2017) supported the S&T Museum project of rural middle schools, started in 2012, to reduce the science educational distance between cities and the countryside. Up to the present day, there has been an important development of S&T museums in rural areas, so much so that at the end of 2016, there were almost 300 museums, 77 of which located in Tibet, which has at least one museum in each country.

A second level of the S&T museum system in China is represented by mobile science and technology museums and science popularization caravans, which are popular and important in remote areas in China. The pilot project of China mobile science and technology museums was officially launched in 2011. In 2013, the project received support from the Ministry of Finance, with an annual financial input of CNY 80 million to encourage the establishment of new mobile science and technology museums. At present, mobile science and technology museum projects have covered 23 provinces and autonomous regions. By the end of 2017, China mobile science and technology museums had 364 sets of exhibitions and held 2339 itinerant exhibitions, which have benefited 87.5 million people (Long 2008). Science popularization caravans are another kind of mobile S&T museum. The caravans allow circulating exhibitions of scientific content even in the most remote areas and to allow an ever-larger number of people (young people but also adults) to have a first approach with scientific knowledge. This caravan project started in 2000. By the end of 2014, a total of 865 science popularization caravans had been distributed nationwide, with 129,900 activities and 1611.3 million

visitors (China Science and Technology Association 2017). Currently, each municipality, province and autonomous region has its own scientific popularization caravan.

The third level of the S&T museum system in China is represented by virtual S&T museums, which are very popular in this new era of the Digital Revolution. Most S&T museums provide online services and are open to all citizens. In December 2005, the Digital Science and Technology Museum began to construct the only basic science infrastructure platform projects which had public access. The project aims to use modern information technology to transform the results of scientific research, science education and popular science activities into digital S&T educational resources and use various information technologies to integrate high-quality digital science resources for the whole society and build an online platform for searching and sharing information. The online S&T museums provide convenient and fast public science services for young people all over the world. Furthermore, the online S&T museums were very useful in providing remote learning opportunities for students during the quarantine in 2020 when COVID-19 overspread in China.

The primary purpose of the S&T museums is to support the dissemination of scientific knowledge among increasingly broader sections of the population. The importance and role of education are becoming more and more essential. However, due to the lack of professional staff in the S&T museums and the limited financial support, the S&T museums in China are far from perfect, especially the operation of the mobile S&T museums and the virtual S&T museums. Lately, the bottom-up online science education practices have lit up a new path for STEM learning. Many organizations and STI companies are leading this kind of movement. For example, Ping An China and the China Next Generation Education Foundation launched the “AI Not Reading Alone-Youth Science and Technology Literacy Improvement Program” in 2019. This project provides science classes for 1000 remote rural primary schools across the country. The most important part is that this project invited experts and scholars to develop suitable teaching materials and experimental contents for rural children, assisting rural schools in the construction of popular science laboratories and providing relevant training for principals and teachers.

Investing in the future is a main topic for China, in order to explore the educational function of S&T museums as an expression of an authentic educating city and to improve human capital, especially the scientific literacy of the whole country, which require continuous efforts from the whole society. Although the practices in China are still to be perfected, they represent fundamental action which must be improved to pursue the path of social integration and growth both in large and small communities. The various educational initiatives promoted in China through science and technology museums represent one of the possible expressions of the educating city which—in this case—through institutions is mobilized to enrich citizens culturally, thus helping to support the growth of both individuals and the collectivity.

4. Conclusion: The Educating City to Face the Challenges of Globalization

The main purpose of this article is to show how the integration of economic competition into a participatory and relational sphere is necessary to foster an effective socially integrative city by strengthening the role of museums in particular. The theoretical and applicative analysis explained in the previous paragraphs suggests that the educating city can be seen at the crossroad between two forms of globalization: (a) the first one, which puts the individuals' and the community's self-fulfillment into the foreground in the name of cooperation and solidarity; (b) the other one, focused on economic competition. Therefore, the first form of development enhances the differences and peculiarities among people and cultures, while the second form of development pushes towards a lifestyle's homologation, as every aspect of life is brought back to the economic dimension.

Anyway, it is even too easy to interpret the polarity just described in a Manichean way. In fact, people live both within the material production systems and within the cultural and symbolic systems. These two spheres can (and must) know an integration. The economic push towards globalization can be a spur to integration among peoples, as it enables peoples to confront and relate to each other, thus counterbalancing the temptation of each culture to claim its idiosyncratic exclusivity opposing the "Other", leading to fragmentation. If, however, the dynamics of power connected to economic competition prevail, then the self-determination of peoples and cultures weakens. Democracy consequently enters a "crisis" (cfr. Crozier et al. 1975) and becomes hostage to powers that prevent its effective deployment. In this case—as Crouch (2004) observes—a passive attitude of people towards democracy prevails: many individuals of Western societies claim, in fact, their "rights" (to private property, to be protected, to criticize the politicians' work and also that of getting angry with political failures: corruption, lack of results, growing inequality, etc.), forgetting, however, the importance of active commitment in co-building democracy (by participating in politics through voting, associating and organizing, trying to be better informed, proposing alternatives, etc.).

The competitive aspects—related to the "power of knowledge"—and the cooperative aspects—related to the co-construction of knowledge in a cooperative perspective—are not, therefore, to be seen as opposed: they are co-present moments, and they have to be integrated. The epistemology of complexity underlines that a complex system is capable of developing "emerging properties" (or "collective properties"), precisely thanks to the competition-cooperation that is triggered between the various parts which compose a system (Anderson 1972; Waldrop 1992). These "parts" are often "agents" themselves, as happens in social and economic systems, that is, endowed with self-organization and proactivity but also with an "openness" to the environment (von Bertalanffy 1968).

The museum's role in the analysis carried out highlights the complementary needs just mentioned: in the first analysis, the museum is described as a "collective

fact", in which "learning" is subordinated to social integration and social construction processes; in the other case, the opposite is true, that is to say integration is a by-product of knowledge, since "knowledge is power" and without this power, the minimum requirements for participation are missing.

A city is typically an "open system" because it exists in continuous interrelation with the environment. Prigogine notes that a city is not a crystal preserved in a bell jar because a city is inconceivable beyond its interrelationships with the rest of the world. Therefore, an educating city has a "double face": on the one side, it has "its own personality" (IAEC 2004); on the other side, it is characterized by a "bottom-up" participatory process, as highlighted by the epistemology of complexity. An educating city represents a "lived place" (Magnaghi 2011; Dardel [1952] 1990) able to counterbalance a globalization conceived exclusively on the side of economic efficiency that empties places of its intrinsic quality. In this sense, museums—as the case studies of educational museums demonstrate—can represent urban laboratories, capable of encouraging processes of participation, comparison and cultural exchange.

However, the educating city as an "open city" which has continuous interactions with the environment must be able to actively react also to constraints and pressures of different types, including the competitive ones, putting in place a "critical adaptation" (IAEC 2004): "persons must educate themselves for the sake of their critical adaptation to and active participation in the challenges and possibilities opening up as a result of the globalization of all economic and social processes, so that they can intervene—through their local world—in a complex international scenario, and in order to remain autonomous subjects in the face of a flood of information controlled by economic and political power centres" (ibid.).

The challenges of globalization, therefore, are not taken up in an uncritical or passive way, but by asserting the cities' "voice". The role of the educating city is therefore that of promoting the development of a civic and cultural awareness thanks to self-organizational processes, while maintaining an "openness" to the context: undergoing pressure but also, thanks to its own "agency", advancing context requests and proposals that can put pressure on politics and the economy. In this sense, it would be appropriate that opinion groups, cooperation networks, neighborhood welfare and voluntary activities do not remain forms of self-help which "involve turning away from politics, [and] they cannot be cited as indicators of the health of democracy, which is by definition political" (Crouch 2004, p. 16). They have to assume the form of the political proposal. For example, with regard to the Italian context, the role of mayors and local administrators is considered by people still capable of affecting reality. The educating city carries out a political activity, by integrating the cultural and educational dimension with the civic-institutional dimension and the economic one too. It is a laboratory of neo-democracy, as it can develop new forms of active participation and self-determination. Having

a personality is “formative” towards inhabitants; on the other hand, it can allow a city to become an incubator of proposals, lifestyles, instances and projects that can put pressure on the outside world and also on politics.

Confirming that the participatory and the competitive aspects are complementary and answer the different needs of the contexts in which they are developed, it should be emphasized, finally, that the concepts of “integration” and “participation” have different nuances: “participation” requires the active contribution of the person and the community, while “integration” can be governed from above in a “top-down” way.

Author Contributions: Introduction, F.d.; paragraph 2, E.P.; paragraph 3, Z.X.; Conclusion, S.P. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the TRANS-URBAN-EU-CHINA project.

Conflicts of Interest: The authors declare no conflict of interest.

References

- Anderson, Philip W. 1972. More is different. *Science* 177: 393–96. [CrossRef] [PubMed]
- Angori, Sergio. 2016. Learning city. *Accademia Etrusca di Cortona XXXV*: 57–66.
- Ascenzi, Anna, and Elisabetta Patrizi. 2014. I Musei della scuola e dell’educazione e il patrimonio storico-educativo. Una discussione a partire dall’esperienza del Museo della scuola «Paolo e Ornella Ricca» dell’Università degli Studi di Macerata. *History of Education & Children’s Literature* 9: 685–714.
- Barros, Rosanna. 2013. From lifelong education to lifelong learning. *European Journal for Research on the Education and Learning of Adults* 1: 33–47.
- Bauman, Zygmunt. 2008. Public Space. In *Education and Urban Life: 20 Years of Educating Cities*. Edited by Eulàlia Bosch. Barcelona: International Association of Educating Cities, pp. 47–56. Available online: <https://www.edcities.org/en/wp-content/uploads/sites/2/2015/02/Education-and-Urban-Life.pdf> (accessed on 8 July 2020).
- Bertolini, Piero. 1989. La città: Un oggetto pedagogico? In *La Città Educante*. Edited by Mario Gennari. Genova: Sagep, pp. 45–59.
- Beruglia, Cristoforo Sergio, Andrea Stanghellini, and Silvia Infusin. 2004. *Il Museo Educativo*. Milano: FrancoAngeli.
- Borello, Claudio. 1989. La città come utopia educativa. In *La città educante*. Edited by Mario Gennari. Genova: Sagep, pp. 61–83.
- Borja, Jordi. 1998. Ciudadanía y espacio público. In *Ciutat Real, Ciutat Ideal. Significat i funció a l’espai urbà Modern*. Edited by Pep Subiròs. Barcelona: CCCB.
- Bosch, Eulàlia, ed. 2008. *Education and Urban Life: 20 Years of Educating Cities*. Barcelona: International Association of Educating Cities, Available online: <https://www.edcities.org/en/wp-content/uploads/sites/2/2015/02/Education-and-Urban-Life.pdf> (accessed on 8 July 2020).

- Brunelli, Marta. 2018. *L'educazione al patrimonio storico-educativo. Approcci teorici, modelli e strumenti per la progettazione Didattica e formative in un museo della scuola*. Milano: FrancoAngeli.
- Carreño, M. 2008. Los nuevos museos de educación, un movimiento intencional. *Encounters on Education / Encuentros sobre Educación* 9: 75–91.
- Chen, Simin, and Jiazeng Fang. 2006. A comparison of Science and Technology Museum between China and UK. *Science Popularization* 2: 36–42.
- Cropley, Arthur John, ed. 1979. *Lifelong Education: A Stocktaking*. Hambourg: UIE.
- Crouch, Colin. 2004. *Post-Democracy*. Cambridge: Polity Press.
- Crozier, Michel, Samuel P. Huntington, and Joji Watanuki. 1975. *The Crisis of Democracy. Report on the Governability of Democracies to the Trilateral Commission*. New York: New York University Press.
- China Science and Technology Association. 2017. Research report on the construction and development of modern science and technology museum system with Chinese characteristics.
- Dardel, Éric. 1990. *Homme et la terre. Nature de la réalité géographique*. Paris: CTHS. First published 1952.
- del Pozo, Joan Manuel. 2008. The Concept of the Educating City Today. In *Education and Urban Life: 20 Years of Educating Cities*. Edited by Eulàlia Bosch. Barcelona: International Association of Educating Cities, pp. 23–32. Available online: <https://www.edcities.org/en/wp-content/uploads/sites/2/2015/02/Education-and-Urban-Life.pdf> (accessed on 8 July 2020).
- de Varine, H. L'ecomuseo. 2005. *Le radici del futuro. Il patrimonio culturale al servizio dello sviluppo locale*. Edited by D. Jalla. Bologna: Clueb, pp. 241–273.
- Dewey, John. 1916. *Democracy and Education*. New York: The Macmillan Company.
- Dewey, John. 1940. *Education Today*. New York: G.P. Putnam's Sons.
- Escolano, Benito Augustín. 2010. Sherlock Holmes goes to school. Ethnohistory of the school and educational heritage. *History of Education & Children's Literature* 5: 29–32.
- Fernando, Jordi, and Sussi Morell, eds. 1990. *La Ciudad Educadora*. Barcelona: Ayuntamiento de Barcelona.
- Frabboni, Franco. 1990. La integración escuela-territorio. In *La Ciudad Educadora*. Edited by Jordi Fernando and Sussi Morell. Barcelona: Ayuntamiento de Barcelona, pp. 153–62.
- Frabboni, Franco. 1991. Un'aula grande come la mia città. In *La città educative*. Edited by Franco Frabboni and Luigi Guerra. Bologna: Cappelli, pp. 34–46.
- Frabboni, Franco. 2006. Una politica grande per i più piccoli. In *La città educativa e i bambini*. Edited by Franco Frabboni and Flavio Montanari. Milano: FrancoAngeli, pp. 11–31.
- Gallina, Vittoria. 2004. Opportunità di apprendimento in età adulta: La fruizione dei beni culturali. In *Musei e pubblico. Un rapporto educativo*. Edited by Emma Nardi. Milano: FrancoAngeli, pp. 129–44.
- Gennari, Mario, ed. 1989. Architetture della città educante. In *La città educante*. Genova: Sagep, pp. 135–58.
- Gennari, Mario. 1995. *Semantica della città e educazione*. Venezia: Marsilio.

- Hooper-Greenhill, Eileau. 2007. *Museums and Education: Purpose, Pedagogy, Performance (Museum Meanings)*. New York: Routledge.
- IAEC. 2004. *Charter of Educating Cities*; Barcelona: IAEC. Available online: <http://www.edcities.org/en/charter-of-educating-cities/> (accessed on 23 July 2020).
- Lengrand, Paul. 1965. *L'éducation permanente*. Paris: Peuple et Culture.
- Lengrand, Paul. 1970. *An Introduction to Lifelong Education*. Paris: UNESCO.
- Li, Xihui, and Jixin Huang. 2020. Building a moderately prosperous society in all respects-regional coordination. *China Economist* 15: 73–107.
- Lipovetsky, Gilles. 2017. Educating Cities and Creative Cities: Paths to Better Coexistence. In *City, Living Together and Education*. Edited by Aina Tarabini. Barcelona: International Association of Educating Cities, pp. 14–19. Available online: <https://www.edcities.org/en/wp-content/uploads/sites/2/2017/07/Monograph-City-Living-Together-and-Education.pdf> (accessed on 8 July 2020).
- Llop Torné, Josep Maria. 2009. *City, Urban Planning and Education*. Barcelona: AICE, Available online: https://www.edcities.org/en/wp-content/uploads/sites/2/2009/10/Monogr%C3%A1fico-2009_en.pdf (accessed on 8 July 2020).
- Long, Jinjing. 2008. Review on the project development of China mobile science and technology museum. *Science and Technology Association Forum* 7: 19–21.
- Longworth, Norman. 2006. *Learning Cities, Learning Regions, Learning Communities*. London: Routledge.
- Longworth, Norman, and Michael Osborne, eds. 2010. *Perspectives on Learning Cities and Regions*. Leicester: Niace.
- Lorenzetto, Anna. 1976. *Lineamenti storici e teorici dell'educazione permanente*. Roma: Studium.
- Magnaghi, Alberto. 2011. Draft of the Territorialists' Society Manifesto. Available online: http://www.societadeiterritorialisti.it/wp-content/uploads/2013/05/110221b_draft.of.the.territorialists.society.manifesto.pdf (accessed on 23 July 2020).
- Maure, Marc. 1996. La nouvelle muséologie, qu'est-ce que c'est? In *Museum and Community*. II Icoform study Series 25; Edited by Martin R. Schärer. pp. 127–32.
- Meda, Juri. 2013. La conservazione del patrimonio storico-educativo: Il caso italiano. In *La historia de la cultura escolar en Italia y en España: Balance y perspectivas*. Edited by Juri Meda and Ana Badanelli. Macerata: Eum.
- Meirieu, Philippe. 2008. Lifelong Education: A Political Option. In *Education and Urban Life: 20 Years of Educating Cities*. Edited by Eulàlia Bosch. Barcelona: International Association of Educating Cities, pp. 228–38. Available online: <https://www.edcities.org/en/wp-content/uploads/sites/2/2015/02/Education-and-Urban-Life.pdf> (accessed on 8 July 2020).
- Mencarelli, Mario. 1964. *Educazione permanente. Dall'educazione di base all'educazione dell'adulto*. Brescia: La Scuola.
- Müller, Bernard, Paulina Schiappacasse, Jianming Cai, and Enpu Ma. 2019. D 6.6 Workshop Report on “Theoretical aspects of transition towards urban sustainability and the role of socially integrative cities”. In *Transition towards Sustainability through Socially Integrative Cities in the EU and in China*. Edited by IÖR and Trans-Urban-EU-China. Dresden: IÖR, Technische Universität Dresden, Chinese Academy of Sciences.

- Ortega Esteban, José. 1990. La idea de ciudad educadora a través de la historia. In *La Ciudad Educadora*. Edited by Jordi Fernando and Sussi Morell. Barcelona: Ayuntamiento de Barcelona, pp. 91–102.
- Osborne, Michael, Peter Kearns, and Jin Yang. 2013. Learning cities. *International Review of Education* 4: 409–23. [CrossRef]
- Perucca, Angela. 2007. Il gioco del convivere nella città globale. In *L'accoglienza del Bambino nella città Globale*. Edited by Pierpaolo Limone. Roma: Armando, pp. 39–50.
- Piazza, Roberta. 2013. *Learning City. Aspirazioni e ideali per le città del benessere*. Roma: Aracne.
- Piazza, Roberta. 2015. Le learning city. In *La città che apprende*. Edited by Edaforum. Scandicci: La fabbrica dei saperi.
- Schwartz, Bertrand, Guy Jobert, and Henri Desroche. 2009. L'éducation permanente, un projet d'avenir. *Education Permanente* 180. Available online: http://www.education-permanente.fr/public/articles/articles.php?id_revue=1698&id_article=1912#resume1912 (accessed on 8 July 2020).
- Somoza Rodríguez, Miguel. 2013. Museología de la educación: ¿Divulgación cultural, atractivo turístico o práctica historiográfica? In *La Historia de la cultura escolar en Italia y en España: Balance y Perspectivas*. Edited by Juri Meda and Ana Maria Badanelli. Macerata: Eum, pp. 141–66.
- Suchodolski, Bogdan. 1992. *Educazione Permanente in profondità*. Padova: Alfasessanta.
- Tarabini, Aina, ed. 2017. *City, Living Together and Education*. Barcelona: IAEC, Available online: <https://www.edcities.org/en/wp-content/uploads/sites/2/2017/07/Monograph-City-Living-Together-and-Education.pdf> (accessed on 8 July 2020).
- Trilla Bernet, Jaume. 2005. La idea de ciudad educadora y escuela. *Revista Educación Y Ciudad* 7: 73–106.
- UNESCO. 1972. *Learning to Be*. Paris: Unesco.
- UNESCO. 2014. *Beijing Declaration on Building Learning Cities*; Beijing: Unesco. Available online: <https://unesdoc.unesco.org/ark:/48223/pf0000226755> (accessed on 25 September 2020).
- von Bertalanffy, Ludwig. 1968. *General System Theory: Foundations, Development, Applications*. New York: George Braziller.
- Waldrop, Morris Mitchell. 1992. *Complexity. The Emerging Science at the Edge of Order and Chaos*. New York: Simon Schuster.
- Yanes, Cristina. 2010. The museum as a representation space of popular culture and educational memory. *History of Education & Children's Literature* 6: 19–31.

The Role of Heritage in Building a Socially Integrative City: A Comparative Approach

Lisbet Sauarlia and Yu Wang

1. Introduction

Heritage has become an important part of urban development and has become a strength for urban renewal strategies; it has also been identified as an effective tool in building a socially inclusive city. As UNESCO asserted, “culture has the power to make cities more prosperous, safer and sustainable” (UNESCO 2016, p. 18). Historic districts, as parts of heritage, have become valuable spaces due to the sense of the place, which reflect the local identity and which has been transferred into cultural tourism. The TRANS-URBAN-EU-CHINA project agrees that “Heritage is a way to remember the past, be it tangible or intangible. Forgetting is an integral part of this remembering”¹ (TRANS-URBAN-EU-CHINA 2018). This is reflected via the following: “This effect has been increased in the modern society especially after post-war period and in the age of globalisation as the globalisation of the public anxiety around memory in a media saturated world, and its flip side, a feverish obsession with not forgetting, needs to be viewed as one of the most important cultural developments of the past few decades” (Huyssen 1995, p. 57). To be able to preserve or create memories, it is necessary to also forget certain things. It is an active process, where what is seen as important or valuable should remain. To remember everything would be overwhelming, if not impossible, so what we regard as insignificant needs to be forgotten. It creates a manageable room, both for the individual and the collective memory. Heritage is also a reflection of how we view ourselves today. It is not only a question of masterplans and the tourism industry but has symbolic and political meaning. The past seems to be adapted and modified by present demands, where the creative side of culture and tradition plays a crucial role in facilitating and maintaining the process of symbolic construction (Park and Stephenson 2007). Property is fixed, possessed, controlled by its owner, and alienable. A monument can symbolize victory and a grand past, and for others a history of suppression.

¹ The understanding of heritage has been mentioned on TRANS-URBAN-EU-CHINA project deliverable “D1.1 Report, including good practice examples in Europe and China, derived from the knowledge base” which is available on http://transurbaneuchina.eu/fileadmin/user_upload/tuec/files/Deliverables/TRANS-URBAN-EU-CHINA_D1.1_POLITO__20190129_V4.0.pdf (accessed on 26 April 2021).

Horizon 2020 TRANS-URBAN-EU-CHINA aims to answer the question of how to create socially integrative cities in an environmentally friendly and financially viable way.² Underpinning that aim, this article is going to adapt a comparative approach using two different cases: the first is a working-class area in Norway that has been reshaped by the process of gentrification. The second is a historic district in China dominated by an ethnic minority, the Hui Chinese. These areas are experiencing different forms of transition, related to old roots and definitions of identity. Despite the obvious differences between these two cases they have also experienced some interesting similarities in the last decades.

The historic district, as a type of cultural heritage, has been labeled as the target of urban regeneration projects with the aim of upgrading the urban infrastructure and fulfilling the new demands of modern urban life. Underpinning that aim, via a series of urban regeneration projects, could change the urban structure. The area where the most urban regeneration projects take place is the old town of the city; therefore, they are likely to be listed. As a result, urban regeneration projects will have a considerable impact both on the physical environment in historic districts and on the residents who live in the district. This article has analyzed two urban regeneration cases in the historic district: Baklandet district in Trondheim Norway and Drum Tower district in Xi'an China. The analysis of those two cases displays the impacts of urban regeneration on the historical district as a way to uncover the key role local community plays in the transformation of their district, which is triggered by urban regeneration projects.

The objective of the article is to discuss the impacts of urban regeneration projects on historical districts, especially the role local inhabitants play in the process. In order to cope with that research question, the researchers selected two case studies Baklandet district in Trondheim Norway and Drum Tower district in Xi'an China. We compared the pathway of urban transformation caused by urban regeneration projects. The cases were selected for two reasons: one, this research is under the framework of Horizon 2020 TRANS-URBAN-EU-CHINA, which identifies the research scope as between Europe and China, and two, the selected cases are easy to access, which allowed the research team to collect data and conduct fieldwork within a limited time and on a budget. The research team is from the Norwegian University of Science and Technology (NTNU) and its campus is located in Trondheim Norway, where Baklandet District is located. The NTNU research team had several research projects in Drum Tower historical district in Xi'an, which built a solid foundation to conduct a comparison study with the case in Norway. During the study, data

² The research objective of TRANS-URBAN-EU-CHINA is reflected in the project description on <http://transurbaneuchina.eu/project/about-project/> (accessed on 26 April 2021).

collection was divided into two parts: part one was gathering the historical materials from existing research and literature, and part two was the fieldwork during which participatory observation was the main method to collect data.

2. Urban Regeneration in Historic Districts: Theoretical Argument and Research Method

Historical districts are the manifesto of the past with the rich historical information. However, with outdated infrastructure and living spaces of pre-modern society, historical districts cannot meet the standards of daily life nowadays. Furthermore, they do not support the functioning of a modern city. Hence historical districts are the inevitable targets of urban regeneration.

Sometimes the regeneration activities in the historical districts are initiated by the local community, is a self-organized activity that can bring small modifications to the neighborhood. Due to the lack of control, self-organized urban regeneration can sometimes cause damage to historical values. Sometimes the municipality makes plans for urban regeneration in historical districts, which will usually be large upgrades to the neighborhoods in order to let the old areas of the city connect to modern urban infrastructure and services. Government-dominated upgrades in historical districts can increase the livability, which enables the local neighborhoods in those areas to share the results of the urban development and narrow the gap of living standards between old and new neighborhoods. In the meantime, this type of urban regeneration can balance the protection of historical values and the modernization of the neighborhoods, which also bring new activities, improve the built environment quality in historic districts and keep the district competitive in the urban fabric. However, sometimes top-down urban regeneration in historical districts only pays attention to upgrading the physical built environment, with less attention to the local community who are the carriers of social memory of this place and the intangible heritage in the neighborhood. In some cases, after the government-oriented urban regeneration plan, the original residents of the neighborhoods in this area are replaced by new higher-income residents, or, in extreme case, habitation is eliminated after the urban regeneration and replaced by profitable commercial activities, which will eventually decrease the heritage values of the historical districts.

The people-centered conservation and regeneration approach aims to avoid the shortcomings of the above two methods for urban regeneration in historical neighborhoods. The key of this approach is the involvement and designated roles of the original community, local authority, real estate developers and conservationists in the process of urban regeneration.

In the operation phase, the policy should ensure that multiple stakeholders can be involved and play an important role in the entire process of conservation and regeneration projects in the historical districts. Additionally, the methods for effective

teamwork of multiple stakeholders in this process should be in position and a team of specialists, to act as icebreakers and teamwork facilitators, should be assembled. Furthermore, monitoring the project performance and post-project evaluation also requires the feedback of all stakeholders.

The two selected cases in this research are historic towns with local inhabitants and the impacts of tourism on local development are considerable. However, the method of intervention of historic districts and the process of the decision making were different, which caused different chain reactions and pathways of evolution in the two cases. That can be identified as two typical development methods in the historical district. Therefore, this research explores those two cases and initiates a comparative study via a review of its process of development in relation to tourism business and the role of the local community. Through the comparison, the paper aims to uncover how important local inhabitants can be in the process of regeneration.

3. Bakklandet: A Norwegian Example³

Bakklandet is a historic district in the city of Trondheim Norway. It is located on the east side of the Nidelva River and the Old Town Bridge. Bakklandet is a neighborhood with a built environment of traditional wood buildings in a narrow street. By the early 1600s, the center of Trondheim had grown, and the city needed to expand. As a result of this, Bakklandet, laying on the other side of the river encircling the city center, became Trondheim's first suburb. Bakklandet soon developed into a bustling trading place, with small factories and workshops. The venues and residential buildings followed and, unregulated as the area was, streets and houses were built where there was natural space. It was mostly fishermen, craftsmen and workers who settled in the district. The houses were small and simple. In the 1960s the district was threatened with remediation. A new route through Trondheim was planned and it was decided that the Bakklandet settlement had to be removed. There was however great commitment to preserve the old settlement, and enthusiasts were at the forefront of the struggle against the municipality. Their involvement did not lead to immediate victory, but the municipality has never completed its plans. From the 1970s, the settlement was restored and Bakklandet is today an idyllic district. It is a popular place for tourists, as well as locals to visit, with its many restaurants and coffee shops. The struggle for conservation proved to be vital and today the municipality's plans seem unreal. Regardless of political color, all Trondheimers are

³ The result of this case study was submitted as TRANS-URBAN-EU-CHINA project deliverable D1.1 Report, including good practice examples in Europe and China, derived from the knowledge base, available on http://transurbaneuchina.eu/fileadmin/user_upload/tuec/files/Deliverables/TRANS-URBAN-EU-CHINA_D1.1_POLITO__20190129_V4.0.pdf (accessed on 26 April 2021).

proud of this district and it is something they gladly show visitors (Bakklandet.info 2011).

In the 1960s, there was widespread consensus that the old wooden quarters of the city needed to be renewed—and that the old wooden houses should be replaced by modern buildings that were, both economically and functionally, better suited to the demands made by modern society. This modernization project reflected a hegemonic understanding of the city as an economic arena adapted to a modern, capitalist economy. As an important measure, Trondheim drew up a masterplan for the city's development and management of land use, presented as a first draft in 1965, which prepared the ground for the demolition of the historical city center of Trondheim. Trondheim municipality had, since the early 1950s, plans to turn Bakklandet into an efficient road system for the city. The municipality was largely ruled by Labour and Conservatives in this period. The Labour party's post-war reconstruction efforts were carried out in the sixties, with modernization and facilitation for increased prosperity as a leading principle. With these good intentions, it was also understood that something had to be sacrificed on the altar of progress. The conservation, however, was quite remote, and those who claimed otherwise were seen as sand in the machinery. The Labour party received support from the Conservatives and the city council coordinated well. There was no room for preservation; Trondheim should modernize and adapt to the rapid development of the world. A common opinion among politicians and the people of Trondheim was that the area should be demolished.

In the 1970s people started to react and mobilize against the municipality's plans. The conservationists were often residents, associates, and enthusiasts. They received support from the SUFs (Sosialistisk Ungdomsforbund), a youth party on the outer left, known for being political activists. The first organized initiative to take care of the district came from the "Environmental Group on Bakklandet" in 1971. The environmental group was the precursor of Bakklandet and Lillegårdsbakkens Velforening, a residents' association for the area. Their goal was to preserve Bakklandet as a residential area. Many in the area lived in quite dilapidated houses but the cost of living was affordable. Students also took part in the conservation idea, although they lived there only for limited periods. An important step towards demolition was to convince local owners to sell their houses to the municipality. Many were convinced and since these houses were left empty with no maintenance, the area got rapidly worse. Occupation of these houses was used as a counteraction. The residents' association took the initiative to move people into the empty houses to prevent further decay. Architects from the university made an alternative masterplan proposing a zoning plan that would preserve Bakklandet as a residential area. In addition, relentless action of squatting, petitioning, theme concerts, and "walk-slowly" civil disobedience actions were arranged. In the end, protesters won and the plans

were not enforced. Property that had been expropriated or bought from locals was sold to private people (Figure 1).

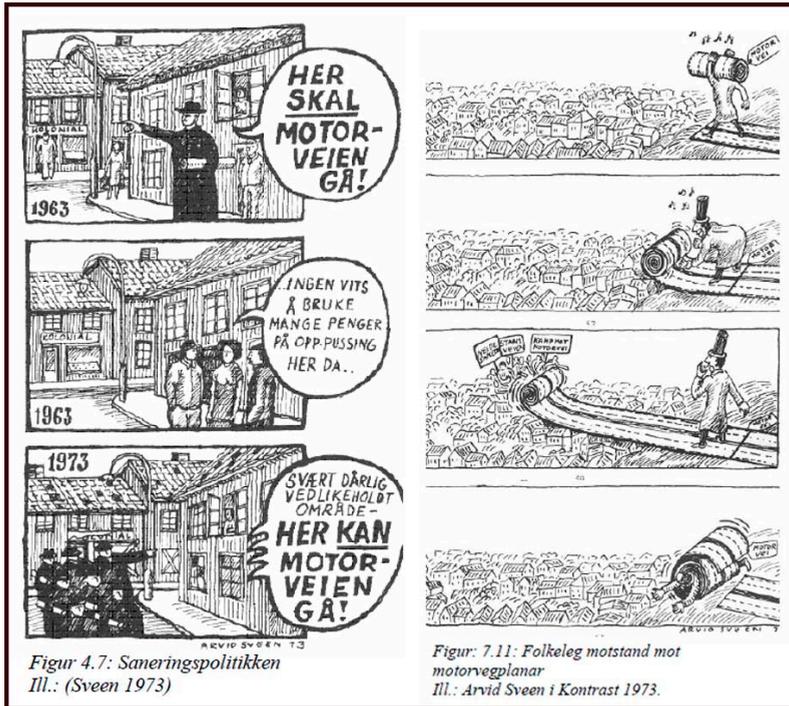


Figure 1. Illustration by Arvid Sveen. Source: *Kontrast* 40/1973, used with permission.

Today, Bakklandet appears as an idyllic district and with favorable living conditions. It has become one of the city’s most important tourist attractions and is known far beyond the country’s borders. Trondheim tree houses are now considered some of the most important in Europe. The goal of the activists was reached, but with one drawback; today, Bakklandet is so attractive that housing prices have shot up, thus excluding many from living there. A large part of the original population moved to new suburbs, and people with higher levels of education and income moved in. Bakklandet has experienced a gentrification process—saving the built environment but changing the everyday life and culture.

4. Xi'an Bei Yuan Men Historic District: The Muslim District⁴

The Muslim district in Xi'an, China, is situated in the middle of the city center, north of the Drum Tower. A majority of the population are Hui Chinese, descendants of traders from the Middle East traveling to China along the Silk Road from the seventh century, during the Tang dynasty. Through generations of cohabitation and intermarriages with Han Chinese, many have adopted Chinese traditions and the lifestyle. Today approximately 32,000 Hui reside in the area.

Entering the Muslim district from the broad and busy streets of downtown Xi'an is like coming to a different world. The streets are narrow, and the houses are mostly one or two storeys, in a Ming or Qing-dynasty style. Here the pedestrians compete for the right of way with both cars and tricycles. The pavements are filled with chargrills filled with food for sale and souvenir shops displaying their goods. It is noisy and smoky, narrow and crowded. The dimensions of the streets and height of the houses provide a warm and interesting atmosphere. The houses are built in the local traditional courtyard style, identical to the Han Chinese style. Most of them are relatively narrow towards the front, but can be deep, varying from one to four courtyards. Doing business has been the main profession for the Hui. This is reflected in the traditional organization of the courtyard houses. The production for the extended family's business took place in the backyard. The middle part was reserved for the living accommodation, hierarchically structured with the oldest generation occupying the rooms in the middle towards the back. Sons with families lived in the side rooms. The front part was reserved for the shop, selling the family's production. This kind of "production line" is becoming less common (Figure 2).

⁴ The result of this case study was submitted to TRANS-URBAN-EU-CHINA project deliverable D1.1 Report, including good practice examples in Europe and China, derived from the knowledge base, available on http://transurbaneuchina.eu/fileadmin/user_upload/tuec/files/Deliverables/TRANS-URBAN-EU-CHINA_D1.1_POLITO__20190129_V4.0.pdf (accessed on 26 April 2021).



Figure 2. Muslim district in Xi'an. Credit: © Lisbet Sauarlia.

Another change in this area is the introduction of chain restaurants. They are introducing a new style and layout that is in harsh contrast to the traditional style. Some shops and restaurants are also going deeper into the courtyard than before, some all the way, breaking the tradition with house owner living and doing business in the same dwelling. Locals with the financial capacity have chosen to move out to new, more modern apartments in the suburbs.

The practice that all sons inherit means that more people are entitled to a share of the courtyard house. This creates serious pressure on space. The traditional system with extended families is splitting up into nuclear units. Several floors are added on to what used to be a one or two-story wooden housing area. Inside the courtyards there are aluminum gates, protecting each nuclear family's privacy. Many also choose to rearrange their houses so they can rent out rooms to migrant workers. Wooden structures are replaced by concrete. The result is added indoor space and more apartments for families. Indoor bathrooms and kitchens make life more convenient. It does, however, also create smaller, darker outdoor space with no room for common activities and very little ventilation. This creates safety issues by making access for emergency services difficult (Sauarlia 2013).

This lack of common space will most likely affect the everyday life of a family. From being extended families, with shared social and economic life, there is now no room for common activities. Jean Paul Loubes described the same, but with reference to the Xi'an Muslim community at large. "Public space is the place for public facilities, services and functions. It is the place of expression of collective life

in its social, economic dimensions. Public space is the place of collective memory. It allows the access, practice, preservation of the monuments in a city, which are the common historical and cultural heritages of the group" (Loubes 1997, p. 97).

The mosques in the area can be described as living monuments. Most of them are built in the traditional Chinese temple style, with open courtyards divided by gates. There are about 10 mosques inside the district, the most famous being the Great Mosque, built during the Tang Dynasty. It is also the biggest, with five courtyards. In 1956 it was protected by the Historical and Cultural Site Protection at the Shaanxi Province Level, and in 1988 put on the list of Major Historical and Cultural Sites Protected at the National Level. It is a busy mosque with Muslims coming for their daily prayers, domestic and international tourists visiting, and children playing.

In a globalized world and a long-open China, the Arabic cultural influence on people is getting stronger. For example, more and more people are wearing clothes that signal their religious and ethnic background. As pointed out earlier, the layout of the houses is in traditional Chinese style, but there will be markers identifying their background. This can be, for example, a picture of Mecca or Chinese characters with Arabic style on the wall.

The building regulations for the area are not always followed. One is the heights of the buildings. Especially around the monuments, houses should not exceed a certain height. It is meant as a buffer zone to protect the monuments. Additionally, the permitted number of floors outside the buffer zone is not always followed. New architectural styles and materials are introduced, breaking with the tradition. Loubes claims, "There is a new urban scenery: arches incorporated in the design of windows and doors, vaults, and cupolas. These signs clearly manifest that one is in an Islamic space" (2013, p. 97). The traditional Chinese tiled roofs are replaced by flat roofs with terraces, giving a different expression. In 1982 Xi'an was on the national list of famous historical and cultural cities, and the Muslim district marked as one of two protected zones. Different attempts by the government to modernize and preserve certain part have not been successful due to the local inhabitants' engagement (Akavarapu 2019). It has been a bottom-up process, resulting in regulations not being followed. Loubes (2013) goes as far as to claim there is a lack of building regulations resulting in a new and vernacular architecture.

5. Conclusions

Two very different cases have been presented here, but with some clear similarities. They are both historic districts, what we can call lived-in-heritage. Local engagement has been essential for turning them into what they are today. Civil actions and negotiation with a government agency have had a vital impact on the development. Both areas have become popular to visit, both for locals and

tourists—the Muslim district by offering exotic food and atmosphere, and Bakklundet by being an idyllic area with coffee shops and restaurants.

Both areas have experienced significant transformations, in terms of tangible and intangible culture. For Bakklundet, the transformation can be described as a process of gentrification. Many of the original inhabitants had to move out to rowhouses or apartment blocks in the suburbs after the municipality took over their homes. The civil actions against the municipality's plan to demolish and turn the area into a four-lane motorway were led mostly by resourceful people, with high education and/or economical status. When the municipality finally turned, they sold the houses they had expropriated to private persons. In the new zoning plan, it was even decided that Bakklundet was now to be considered cultural heritage and that any changes to the built environment had to be approved by the Cultural Heritage Management Office (Kittang 2014). Even though the houses are small, and there are severe restrictions regarding what an owner can do with the house, Bakklundet is a popular area, something that is reflected in high property prices.

The Muslim district has also experienced expropriation of properties due to the government's plans to modernize and upgrade some areas, and people have been forced to move out despite protests from local inhabitants. Even so, most of the owners are the same and have inherited the property from the previous generation. There are however some wealthy locals who have chosen to buy apartments in the suburb. This is similar to what happened in Bakklundet, but whilst this is seen as a step up and an improvement in life in Xi'an, in Trondheim it is regarded as a loss, and was something that first happened to the working class that used to live there. The suburbs are not as attractive as the center. Whilst property prices on Bakklundet have gone drastically up, the Muslim district can offer cheap accommodation, especially for migrants working in the area.

As described above, the Muslim district was appointed as an area of historic value at an early stage. The narrow roads and the wooden courtyard houses surrounding The Great Mosque are of historic interest and of vital importance for the Hui population's identity and everyday lives. However, regulations are not followed and vernacular architecture is threatening the area as a historic district. Additionally, new symbols are added, emphasizing the roots of the Hui as Muslims descending from the Middle East. New identity markers are created, based on an interpretation of the past.

The transformation in Bakklundet and the Xi'an Muslim district showcases that community plays an important role. Community building in urban transition is a key element for preserving the value of historical districts (neighborhoods). In the case from Norway, when facing the municipality's transition plan to Bakklundet in the 1970s citizens of Trondheim initiated a series of actions against the original local government plan and forced the municipality to change the idea of turning

a historical neighborhood into a freeway passage. Those activities redefined the neighborhood and enabled community building. The case from Xi'an demonstrated how traditional life rituals and Hui religion empowered the community, which allowed the local inhabitants to unite and raise their voices, and eventually forced the local municipality to change its regeneration plan in their district. Additionally, the local community of the Muslim district adapted to new livelihoods and transformed its nationhood into a popular tourist attraction. Those two cases display the importance of involving all relevant stakeholders and identifying their roles in the process of urban transition, which is one precondition to leading a sustainable socially inclusive urban transition. Both cases exhibited that the government administration-dominated exclusive transition plans in this article, the freeway plan in Bakklundet and the urban regeneration plan in the Muslim district in Xi'an, may receive resistance from the local community. Heritage in a socially inclusive city is the place to keep the joint memory and show our reaction and interpretation to the past, which helps us reshape identification of ourselves. Through the two cases this article exposed, it is clear that urban transition in a historical district and neighborhood is a delicate and complex process. The two cases cannot be labeled as a model for creating a sustainable socially inclusive city transition pathway, i.e., Bakklundet has become a standard product of gentrification with the original inhabitants absent in this area. Additionally, in the Muslim district in Xi'an, the new livelihood and multi-generation gathered in a space that used to be only for one family has released serious negative impacts on the physical living environment, which has devalued the tangible heritage in this area.

The challenges to balancing the regeneration of the quality of living and safeguarding the value of the heritage is substantial. As a living space, ancient residential buildings provide limited functions and mismatch the comfortability to modern lifestyle, which is one of the reasons to upgrade the historical neighborhood. Meanwhile, the authenticity as a principle of heritage conservation demands the urban regeneration in historical districts interfere minimally with the historical buildings in order to maintain the historical information. Our suggestion to overcome the challenges is to host a series of debates and workshops between experts (conservationists) and local inhabitants to identify the scope of the projects, which can balance conservation and fulfill the requirements for upgrading the living condition.

The movement of regeneration in the historical district might harm the original inhabitants and force them to move out of their houses. The people-centered approach can make sure the original local community is involved in the process of urban regeneration. However, it still has the risk of letting the local community choose to move out of their neighborhoods. The upgraded infrastructure and improved living quality after the urban regeneration increased the cost of living, resulting in some original residents, especially low-income families, moving out of their neighborhood.

The urban regeneration also increased the values of land and buildings as real estate products, which let residents sell their houses when the upgrades are finished in order to improve the living condition. In order to avoid this situation, a cost-benefit analysis can be performed for the local inhabitants to predict the consequences of the regeneration process in their neighborhood, especially from the economic perspective. Based on the analysis, a regeneration plan in historical neighborhoods should support low-income inhabitants, not only to liberate the historical physical living environment but also the local inhabitants who, as the intangible heritage enablers, wish to remain in their own neighborhood.

The past living culture and prevailing lifestyle might be disconnected. With less support than modern urban infrastructure, for instance lack of tap water supply, gas pipe and district heating, the local community retains traditional daily activities, for example getting water from well and cooking and getting heat from the stove, which generated living culture and custom. Those traditional daily activities are disrupted when modern infrastructure is introduced to the neighborhoods. Additionally, living culture and custom are generally a vague joint social memory. In order to avoid the situation, detailed documentation of those activities is required and the proper demonstration and presentation of those activities after the regeneration will help maintain the social memory.

The cultural heritage showcase in the regenerated area and heritage-based commercial behavior might interfere and conflict with the high quality of the living environment. The privacy of living will be interrupted by the tourism in historical districts as well as the joint social life in the community. The feeling of intimacy from joint community activities will be decreased if those community activities continue to be a showcase for the tourists.

Author Contributions: Conceptualization, L.S. and Y.W.; methodology, L.S. and Y.W.; investigation, L.S. and Y.W.; resources, L.S. and Y.W.; data curation, L.S. and Y.W.; writing—original draft preparation, L.S. and Y.W.; writing—review and editing, L.S. and Y.W. Both authors have read and agreed to the published version of the manuscript.

Funding: This research received funding from European Union's Horizon 2020 research and innovation program under grant agreement No. 770141.

Conflicts of Interest: The authors declare no conflict of interest.

References

- Akavarapu, Sai Varsha. 2019. Places in Transition. A Comparative Study of Impacts of Placemaking Strategies on the Quotidian of Historical Districts in China and India. Master's Thesis, Norwegian University of Science and Technology NTNU, Oslo, Norway.
- Bakklandet.info. 2011. Velkommen til Bakklandet. Available online: <http://bakklandet.info/#top> (accessed on 31 July 2020).

- Huysen, Andreas. 1995. *Twilight Memories: Marking Time in a Culture of Amnesia*. London: Routledge.
- Kittang, Dag. 2014. *Trebyen Trondheim -Modernisering og Vern. Ein Studie av Byplandebatten 1960–2005*. Oslo: Fagbokforlaget.
- Loubes, Jean Paul. 1997. *Public Space, Drum Tower Muslim District, Xi'an, China*. Project Report 3–97. Oslo: Norwegian University of Science and Technology NTNU.
- Loubes, Jean Paul. 2013. Transformation of the Hui district in Xi'an. *Architecture and Space, ISIM Newsletter* 3: 99.
- Park, Hyung Yu, and Marcus Stephenson. 2007. A critical analysis of the symbolic significance of heritage tourism. *International Journal of Excellence in Tourism, Hospitality and Catering* 1: 1–41.
- Sauarlia, Lisbet. 2013. *Modernity and Individualism; Some Reflections on Changes in the Muslim District, Xi'an*. Edited by Harald Høyem. Paris: Editions Recherche, ISBN 987-7-5608-5309-3. (In Chinese)
- TRANS-URBAN-EU-CHINA. 2018. Grant Agreement. Available online: http://transurbaneuchina.eu/fileadmin/user_upload/tuec/files/contract/Grant%20Agreement-770141-TRANS-URBAN-EU-CHINA_signed.pdf (accessed on 26 April 2021).
- UNESCO. 2016. *Urban Future Global Report on Culture for Sustainable Urban Development*. Paris: UNESCO, Available online: <https://unesdoc.unesco.org/ark:/48223/pf0000245999> (accessed on 30 July 2020).

Urban Transformation and Evidence-Based Decision Making

Embracing Complexity Theory for Effective Transition to Socially Integrative Cities

Edna Pasher, Lee Sharir, Otthein Herzog, Yahel Nudler, Buyang Cao, Zhiqiang Wu and Mor Harir

1. Introduction

Though creating socially integrative and sustainable cities is of great interest to many policy makers, urban authorities, public service providers and researchers, how to harness the city population in order to foster such social cohesion, an indispensable part of the process, is a challenge that has yet to be solved. In this chapter, the authors offer a possible solution from the field of natural sciences, viewing cities as living organisms, and demonstrating the use of this principle in a case study of building an online platform, Community of Communities, and how the latter can contribute to the transition towards digital, sustainable, and socially integrative cities in China and Europe.

Socially integrative cities are defined as:

socially mixed, cohesive, liveable and vibrant. Compactness, functional mix, and intra-urban connectivity as well as equal rights regarding the access to municipal services play an important role. Environmental quality, the quality of public spaces and the quality of life contribute to the well-being of the population, strengthening a sense of community and fostering a sense of place as well as preserving cultural heritage, shape the city's in-ward and outward-bound image. Investments into neighborhood improvement, service delivery, infrastructure and the quality of housing are important supportive measures. Empowerment and participation of the population, as well as social capital, are indispensable. (Müller et al. 2019, p. 1)

Jane Jacobs (Martin 2006) inspired us to acknowledge the fact that cities are about people, and particularly about bringing people together. Cities fulfil the social needs of their residents for physical venues to provide them with interactions that generate innovation, art, culture, and economic activity. In order to keep pace with the modern world, or to catch up with it, a city must focus first and foremost on learning and understanding the needs of its residents, and only then attempt to provide them with appropriate services through a variety of platforms, one of which is technological media. However, as indicated by Müller et al. (2019), the participation and engagement of citizens in such transitions is essential.

In our view, technology can serve as a platform for open innovation (Pasher et al. 2018). Open innovation is a distributed innovation process based on purposely

managed knowledge flows across organizational boundaries (such as city boundaries), using tangible and intangible mechanisms. The technology used in open innovation serves the needs of citizens because it focuses on user-centered design. According to a statement generally attributed to Jack Welch, the legendary former CEO of General Electric, “people support what they help create” (Krames 2001).

From the background theory we have learned and the professional experience we have received through working with cities over the years, we know that engagement of all the stakeholders, including the citizens, creates commitment to achieving the goals that the decision-makers defined. The essential elements for people’s engagement include a shared vision, passion, altruism, and creativity Pasher et al. (2017). Belief in senior management is considered the driving force behind people’s motivation and engagement in collective processes (Smith and Tushman 2005). Leadership that encourages conversations creates civic engagement, collective wisdom, and smart activities. All stakeholders are engaged in addressing the essential issues of the city and are partners in shaping the vision, goals, and strategies used to achieve them.

Engaged citizens will cooperate willingly to contribute to the sustainability of the city, both by raising and prioritizing problems, and through direct involvement in the preparation, planning, implementation, and evaluation of new urban developmental projects (see Lami and Moroni 2020). In addition, citizens can help professionals understand and frame the problems in question more accurately, help to judge the ethical or material trade-offs needed to make a decision, and provide important information for building solutions and assessing possible intervention scenarios (Fung 2015).

Their degree of collaboration will be affected by their level of engagement; when decision makers help them to find, generate or cooperate in new ideas for products, solutions and processes with which they are eager to engage, this will lead to entrepreneurship and innovation in the city, because entrepreneurs and collaborators work with passion (Goldberg et al. 2006). This passion will drive them to connect to other people with whom they share a common bond or interest, and together, they can innovate things that help the city to be sustainable and attractive (Pasher et al. 2018).

In order to nurture a culture of entrepreneurship and innovation in the city, it is useful to consider the Pyramid of Human Capabilities offered by the innovation expert Gary Hamel. Hamel (2007) claims that at the top of the scale are the characteristics of initiative, creativity, and passion. People with these characteristics are those who lead innovation. They are the “soul players” of the city, who are constantly improving and trying new processes, and are eager to develop new ideas and lead the city to success.

Drucker (1994) identifies knowledge as the only meaningful resource, and suggests that the role of leaders in managing people is not to control and command, but rather to enable knowledge-sharing and to define what new knowledge is needed

and how it can be used. The future belongs to cities in which leaders are not afraid to “loosen the leash” and allow their citizens and other stakeholders to be engaged and daring. To encourage such an environment, there is a toolbox that replaces the old mechanisms of control and command. It includes “liberating tools” such as “communities of practice”, “knowledge cafes”, “open spaces”, and “online platforms”. Those tools help to create a city that speaks, learns, mixes, and renews itself for the wellbeing and happiness of its citizens and its leaders, who promise the sustainability of the city (Pasher and Ronen 2011).

Ultimately, smart innovative cities are fundamentally about talented passionate people, and the creation of opportunities for such people to interact in communities, co-create and share new knowledge (Dvir and Pasher 2004). Passionate people enable open innovation because of their motivation to learn, explore, influence and help. If we continuously validate our plans against this key observation, we can do much to make cities smarter and help them to be sustainable and address important national and global challenges (Pasher et al. 2018).

2. Conceptual Framework

Still, attracting innovative and passionate people, and creating the right atmosphere for such innovation to happen, may become labyrinthine. To increase our understanding and ability to make cities digital, sustainable, and socially integrative, we look for inspiration in the natural sciences—specifically, we look to complexity theory (Mitleton-Kelly 2003). According to this theory, the city is a living organism, an ecosystem in which there are close relationships among streams of resources, knowledge, and people, reciprocally influencing each other. It is a system in which, as in nature, a line of co-evolution occurs—the emergence of processes and the self-organization of all individuals in the system—that allows the creation of a new order in a natural evolutionary process. Inspired by this view, there are principles that can be embraced by decision makers in order to manage the system.

According to complexity theory, the system is dynamic and full of uncertainty at its core, making it almost impossible to completely anticipate and control changes and strategies (Taleb 2005; Marion 2015). Moreover, a single optimal strategy is not possible and is undesirable, as any strategy can become optimal under circumstances and maladaptive under others. In a dynamic world, any entity that wishes to prosper has to encourage diversity and explore its full breadth of opportunities and possibilities, creating as many solutions and methods of operation as possible. Stemming from this view are the principles of exploration and experimentation. Those principles favour exploration of all possibilities, simultaneously conducting as many small “experiments” as possible, each with a bearable small cost and risk, drawing conclusions from each experiment and updating the larger strategy. Those

principles emphasize the benefits of experimentation and the way it positively affects the whole system (Mitleton-Kelly 2003).

In addition, the self-organization principle, allowing the processes, stream, and the elements of the system to organize by themselves, is vital. As each element in the system is affecting and affected by the other elements, prearranging the elements of the system is doomed to failure. According to complexity theory, self-organization enables the emergence of a fertile ground for raising ideas and sharing new and innovative knowledge (Mitleton-Kelly 2003).

In this chapter, we present one case study of a technological open-innovation process characterized by the engagement of all stakeholders, who were motivated by passion, altruism, and the desire to cooperate. The case study presents how building an online Community of Communities can contribute to the transition towards digital, sustainable, and socially integrative cities by enabling better communication among all stakeholders in the context of a complex urban environment.

Technology needs to help the decision makers and other stakeholders to achieve their goals, engage the citizens and make the city more attractive and sustainable for everyone. Many of our current social connections are based on a virtual space that enables us to make conversations, share knowledge, stay in touch, and easily reach almost everyone very quickly (Pasher et al. 2017). In big countries, China, for instance, an online platform can be a great solution to overcome the limitations of distance, disabilities and language and enable every citizen to participate in the online discussion and become involved in the main topics and issues that concern the decision makers, thus fostering social integration throughout the decision process.

Today's young people care about the future of the earth. They do not want to continue to pollute the environment and they want to conserve polluting energy. In addition, they look for human contact as they multitask using social media and electronic screens, which they use to share information and knowledge (Augusto et al. 2010).

All the smart cities in the future will use advanced technologies to make the city green, healthy, sustainable, and socially integrative. This combination of the needs of young people, their technological habits and their advantages for the city will help the decision makers achieve it, with the help of communities, engagement, and technology (Pasher et al. 2017).

3. Methodological Framework

In order to establish an online platform, it is desirable to decide on a methodological framework. The methodological framework of Urban Living Labs provides a proper infrastructure for developing effective and flexible online communities.

The concept of Living Lab is a user-driven, open innovation ecosystem based on a business–citizens–government partnership, which enables users to take an active role in the research, development, and innovation process (ENoLL 2006). It was first used to describe R&D processes focused on the user-centered design (UCD) methodology, in which end-users are engaged in the development process from the very beginning. Urban Living Labs (ULLs) constitute a methodology (Eriksson et al. 2005), environment (Ballon et al. 2005; Schaffers et al. 2007), system (CoreLabs 2007), and a governance approach (Bulkeley et al. 2016), whereby urban stakeholders develop and test new technologies, products, services and ways of living to produce innovative solutions to a range of challenges (Marvin and Silver 2016), including new technology, building retrofit, food production, urban landscape, sustainability, knowledge production and economic growth (for a more comprehensive review, see Steen and van Bueren 2017).

The overall aim of ULLs is to learn and experiment by integrating processes of research and innovation (ASC 2016; van Bijsterveldt 2016; ENoLL 2006). Importantly, the aim is not only to learn from experiences in the particular lab environment, but also to replicate the innovation elsewhere, in real life, or to further future innovation (ASC 2016; van Bijsterveldt 2016; Franz et al. 2015; Juujärvi and Lund 2016). ULLs emphasize experimental approaches to governing cities, allowing experimentation before detailed planning is applied (European Commission 2009). Thus, applying the exploration and experimentation principles and testing out new technologies and policies under real-world conditions in highly visible ways can prompt radical social and technical changes aimed at transforming urban governance and foster the transition into socially integrative cities (Baccarne et al. 2014).

Another key element in this development process is co-creation (van Bijsterveldt 2016; ENoLL 2006; Feurstein et al. 2008; Franz et al. 2015; Pascu and van Lieshout 2009; van der Heijden 2016). The essence of a ULL is that they provide a platform for participation and user involvement. Rather than just applying a fixed solution and involving the citizens only in testing, a solution is sought together with all stakeholders, and the direct participation of all stakeholders appears in all stages of the ULL approach—from identifying stakeholder needs, deciding upon ULL goals and visions, planning, designing, developing, implementing and evaluating ULL actions, and updating ULL ambitions. To qualify as co-creation, not only do the targeted users not need to be involved, they should have real decision-making power throughout the phases (Pralhad and Ramaswamy 2004). Furthermore, the development process of living labs is iterative, which implies that, after being designed, the prototype product is used and evaluated by the stakeholders. The feedback and evaluation gathered from these steps are used to further develop and improve the product (Feurstein et al. 2008; Pallot and Pawar 2012; Pierson and Lievens

2005). Thus, ULLs also support the co-evolution, co-emergence, and self-organization principles of complexity theory.

The online Community of Communities (CoC) and the creation process is based on the main principles mentioned above. The CoC is an online platform that is meant to serve all stakeholders in the ULLs and to support the activities that evolve. In accordance with the complexity theory, the CoC is a supportive platform for self-organization, emergence, co-evolution, and the creation of a new order by enabling the users to open their own chat groups, leave comments on every topic, fill polls and chat with each other, without any defined division or close topics. In this way, every community member can react to all ULL activities, watch interviews with different experts from different countries and initiate new online activities (Anthopoulos and Fitsilis 2009).

The platform enables its users to share and create knowledge with citizens, experts, researchers, academia, professionals, and anyone who is interested in participating, from all over the world. The platform enables the collection, integration, and analysis of data of transformative knowledge, which represent fundamental issues that emerge in new and existing cities with respect to governance of urban planning of the urban growth processes. The knowledge created and shared serves all stakeholders, self-organized communities, and each special interest group.

Cities that want to encourage the creation of the vital knowledge that comes from the different interactions among community members should produce appropriate socio-cultural and technical conditions to support this (Pasher et al. 2017). In addition, in order to create an innovative and evolving environment, as in nature, the stakeholders should allow some degree of flexibility. If the new order is over-designed, the people will not be able to organize themselves, but will depend on the help and guidance of designers of the new order (Mitleton-Kelly 2003).

The CoC has evolved to foster this exact environment, providing the link and connecting framework between people, decision-makers, and the community; therefore, a new reality, one that enables innovation, cooperation and creativity, can be created. It is an online platform, accessible and open to all stakeholders and is supported by open source code. On the other hand, this is a flexible self-organizing platform where every user can open discussions, edit contributions, and comment on the different categories.

Another significant advantage of the CoC, is that it is an online platform and every action, initiation, exploration, and discussion is documented. This bottom-up approach is established to collect transformative knowledge from all stakeholders, and especially current and potential citizens. The collection, integration, and analysis of these data through Natural Language Analysis of people's contributions, including emotion recognition, pave the way for a quantitative-based approach, a "digital transition" to urban planning. Hence, it collects and creates data for Artificial

Intelligence analysis, and the insights are fed into the next stage of the urban-planning process, enabling evidence-based governance for urban-planning processes. The data analysis can be done in order to assess the best practices in place-making, quality of public space, public engagement, social cohesion, and cultural heritage, and to identify major themes that play a significant role in the transition of the community into a necessarily “urban” one.

This platform can support the transition towards socially integrative cities by enabling all stakeholders to create and exchange knowledge regarding city planning and development (Otto 2020; Denters and Klok 2010), such as infrastructure, regulations, taxation, health, education and culture, which have a bearing on the framework conditions and which shape the living conditions of residents.

In order to deal with objections and motivate the stakeholders to participate and take an active role in the platform, the engagement must be a win-win situation, as in the Tel Aviv municipality case study.

4. Case Study—The Digital Transformation of Tel Aviv Municipality

In the 1980s, Tel Aviv suffered from a decline in the number of young families due to the aging of the city’s population. Through the development of a comprehensive strategic plan, the city attempted to overcome this trend. To formulate this plan, it gathered specialists from a wide spectrum. The plan was successfully implemented, and the city now enjoys immigration that includes many young families (Pasher et al. 2017).

In order to stay relevant, the city must be flexible and able to adjust to rapid change, and so the system must embrace new ways of communicating with its residents, moving away from the traditional, municipal, one-to-many methods and attempting to create a platform that will support openness, equality, trade, tourism and culture (Pasher et al. 2017). This is very much in line with the current global vision of municipalities, which are expected to deliver much more than efficiency and excellence in services for residents. The new vision prioritizes deeper engagement with the community, involving an open dialogue with and between residents, the creation of new models for trading and sharing goods and services, and, most importantly, making cities livable and equitable (Pasher et al. 2018).

Digital transportation enables municipalities to communicate with the citizens through supporting systems that help to create high engagement, and this is how Tel Aviv has approached the objectives of becoming a smart city, developing a new online platform to enable citizens to co-create the future of the city, together with the municipality (Pasher et al. 2017).

One of the best examples of Tel Aviv’s actions in digital transportation is the development of the DigiTel Residents Club. This club is a personalized web and

mobile communication platform that facilitates a direct and holistic connection between the city and its residents.

This smart application for online public participation brings value to both the residents and the municipality, a smart win-win solution. The residents share their personal data voluntarily in order to obtain individually tailored, location-specific information and services (Tel Aviv 2020).

DigiTel was developed as a robust platform that could be scaled to fit the world's largest cities. The aim was to develop a system that would be more advanced and complex than any other city engagement tool in the world and, for this achievement, Tel Aviv won the world's smartest city award at the Barcelona smart city expo in 2014 (Morag 2014). In addition, Tel Aviv was ranked the second-best innovation ecosystem globally by the start-up ecosystem report (2012). Tel Aviv's population that is well known for its open-minded and technology-driven citizens, and the ability of the municipality to build systems to support a new way of communicating with its residents created a platform that supports openness, innovation and a move away from the traditional one-to-many methods (Pasher et al. 2017).

The benefits of the DigiTel application, as mentioned on the Tel Aviv municipality website, are:

- discounts at Tel-Aviv's numerous culture, sport, art, and recreation facilities;
- live updates about what is happening in the city, adapted to the users' personal interests: culture, music and or/art events, health and lifestyle, sports, children's activities and much more;
- live updates about what is going on in the vicinity of the user's address, and announcements about community events, and the blocking, restoration and construction of streets/areas.

During the Covid-19 crisis, Liora Shechter, the Chief Information Officer of Tel Aviv municipality, was interviewed (Shechter 2020) for the Community of Communities. In this interview, she explained that the municipality needed to adapt to new ways to give added value to its residents and support them, while it also needed to obey the rules and prevent infections. In order to achieve this goal, Tel Aviv uses the familiar DigiTel platform, which the residents already know, to add more relevant information and features. One of the examples is given in the section where residents can report blocking scooters; they now can report on the need for aid for elderly.

Tel Aviv also embraces the innovation and start-up community to help solve the coronavirus issues. One of the applications that was adapted by the department of education in Tel Aviv activated 1000 volunteers using the app to try to help others.

Another community activity is the International Virtual Hackathon that continued for 72 h and invited solutions to support SMEs in Tel-Aviv. All the

solutions became accessible by every country that participated in the Hackathon and all the start-ups got the chance to make connections and receive feedback from experts from all over the world.

5. Conclusions

Embracing complexity theory allows us to better and faster manage the transition to socially integrative cities. According to the complexity theory (Mitleton-Kelly 2003), we live in a world of uncertainty and must be reconciled with having no definitive answers or one way of success. In addition, reality is dynamic and, therefore, an entity that wants to survive and thrive should explore its scope, and consistently continue to try different experiments and create diversity. This means that, from this perspective, the search for a single optimal strategy may not be possible and may be undesirable; any strategy can be optimal under certain conditions. Therefore, the ultimate strategy is to work in parallel on several experiments that have low costs and low risk, draw conclusions from each experiment, and upgrade the strategy (Mitleton-Kelly 2003).

One of the main goals of online platforms is to create engagement. The engagement on the platform will maximize itself through a combination of offline and online activities. (Anthopoulos and Fitsilis 2009). According to the concept of ULLs and the complexity theory, the best way to create engagement is to experiment with the different possibilities (Mitleton-Kelly 2003) that exist in the platform, learn what works and what actions have the potential to last over the long term, and adapt the experiments and prototypes to the dynamic reality (European Commission 2009). User engagement can be done by creating an enabling infrastructure for a fruitful discourse. The city of Tel Aviv engages the citizens by creating an infrastructure that challenges the status quo for constant improvement (Tel Aviv 2020). In the complex postmodern world, there are no right answers, and there is not one truth. We live in an uncertain environment, subject to rapid changes which force us to adjust. Tel Aviv does this by a deeper engagement with the community, involving an open dialogue with and between residents (Pasher et al. 2017).

The experiments can also conclude different kinds of technology tools that will help to prevent technical problems and increase the number of users.

One of the ways to engage experts and people who want to learn from them in the same activity is to establish regular designated events in different topics and invite them to join. A different way of harnessing new members to register with an online platform is to do online workshops for groups of people that knew each other before. The workshops can integrate a variety of forms, such as hybrid, frontal and online, and can also offer different kinds of topics, like global issues and leading questions that the participants are passionate about, as well as guiding the participants on what to do on the platform. The results of this kind of activity are original content

uploaded to the CoC by the community members, attracting new people to register, open discussions that can lead to actions, and innovative ideas that can make a great contribution to decision-makers.

There are many different ways of succeeding with digital platforms (Anthopoulos and Fitsilis 2009). The role of the community manager is to collect the data and information in a systematic way, analyze it using relevant analysis tools and professionals, and present it to decision-makers in a practical way by using forms, reports, or specific conclusions. The decision-makers can easily use this information to generate citizen engagement, support a culture of entrepreneurship and innovation, and draw valuable insights for the benefit of a sustainable and socially integrative city, as in Tel Aviv's case study (Pasher et al. 2017).

Author Contributions: Conceptualization, E.P., L.S., M.H., O.H., B.C., and Z.W.; Methodology, E.P., B.C. and O.H.; Writing—Original Draft Preparation, L.S., E.P. and O.H.; Writing—Review and Editing, L.S., Y.N., E.P., and O.H. All authors have read and agreed to the published version of the manuscript.

Funding: This research has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 770141. The material reflects only the authors' views and the European Union is not liable for any use that may be made of the information contained therein.

Conflicts of Interest: The authors declare no conflict of interest. The funding sponsors had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, and in the decision to publish the results.

References

- Anthopoulos, Leonidas, and Panos Fitsilis. 2009. From Online to Ubiquitous Cities: The Technical Transformation of Virtual Communities. In *Next Generation Society. Technological and Legal Issues*. e-Democracy 2009. Edited by Alexander B. Sideridis and Charalampos Z. Patrikakis. Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering. Berlin and Heidelberg: Springer, vol. 26. [CrossRef]
- ASC. 2016. Urban Living Labs. Amsterdam Smart City (ASC): Amsterdam Economic Board. 14 January 2017. Available online: <https://www.amsterdameconomicboard.com/projecten/amsterdam-smart-city-2> (accessed on 1 July 2017).
- Augusto, Juan Carlos, Hideyuki Nakashima, and Hamid Aghajan. 2010. Ambient intelligence and smart environments: A state of the art. In *Handbook of Ambient Intelligence and Smart Environments*. Edited by Hideyuki Nakashima, Hamid Aghajan and Juan Carlos Augusto. Boston: Springer. [CrossRef]
- Baccarne, Bastiaan, Peter Mechant, Dimitri Schuurman, Pieter Colpaert, and Lieven De Marez. 2014. Urban socio-technical innovations with and by citizens. *Interdisciplinary Studies Journal* 3: 143–56.
- Ballon, Pieter, Jo Pierson, and Simon Delaere. 2005. Test and Experimentation Platforms for Broadband Innovation: Examining European Practice. *SSRN Electronic Journal*. [CrossRef]

- Bulkeley, Harriet, Lars Coenen, Niki Frantzeskaki, Christian Hartmann, Annica Kronsell, Lindsay Mai, Simon Marvin, Kes McCormick, Frank van Steenbergen, and Yuliya Voytenko Palgan. 2016. Urban Living Labs: Governing Urban Sustainability Transitions. *Current Opinion in Environmental Sustainability* 22: 13–17. [CrossRef]
- CoreLabs. 2007. *Building Sustainable Competitiveness-Living Labs Roadmap 2007–2010*. Luleå: Luleå University of Technology, Centre for Distance-Spanning Technology.
- Denters, Bas, and Pieter-Jan Klok. 2010. Rebuilding Roombeek: Patterns of Citizen Participation in Urban Governance. *Urban Affairs Review* 45: 583–607. [CrossRef]
- Drucker, Peter Ferdinand. 1994. *Post-Capitalist Society*. London: Routledge.
- Dvir, Ron, and Edna Pasher. 2004. Innovation engines for knowledge cities: An innovation ecology. *Journal of Knowledge Management* 8: 16–27. [CrossRef]
- ENoLL. 2006. What Is a Living Lab? European Network of Living Labs (ENoLL). Available online: <http://www.openlivinglabs.eu/FAQ> (accessed on 2 August 2016).
- Eriksson, Mats, Veli-Pekka Niitamo, and Seija Kulkki. 2005. *State-of-the-Art in Utilizing Living Labs Approach to User-Centric ICT Innovation—A European Approach*. Luleå: Luleå University of Technology, Centre for Distance-Spanning Technology.
- European Commission. 2009. Information Society and Media. Living Labs for User-Driven Open Innovation, an Overview of the Living Labs Methodology, Activities Achievements. Available online: https://www.eurosportello.eu/sites/default/files/Living%20Lab%20brochure_jan09_en_0.pdf (accessed on 24 July 2020).
- Feurstein, Karin, A. Hesmer, K. A. Hribernik, K.-D. Thoben, and J. Schumacher. 2008. Living Labs: A New Development Strategy. In *European Living Labs—A New Approach for Human Centric Regional Innovation: 1–14*. Edited by Jens Schumacher and Veli-Pekka Niitamo. Berlin: Wissenschaftlicher Verlag.
- Franz, Yvonne, Karin Tausz, and Sarah-Kristin Thiel. 2015. Contextuality and Co-Creation Matter: A Qualitative Case Study Comparison of Living Lab Concepts in Urban Research. *Technology Innovation Management Review* 5: 48–55. [CrossRef]
- Fung, Archon. 2015. Putting the Public Back into Governance: The Challenges of Citizen Participation and Its Future. *Public Administration Review* 75: 513–52. [CrossRef]
- Pascu, Corina, and Marc van Lieshout. 2009. User-Led, Citizen Innovation at the Interface of Services. *Info* 11: 82–96. [CrossRef]
- Hamel, Gary. 2007. *The Future of Management*. Boston: Harvard Business School Press.
- van der Heijden, E. 2016. *Urban Management Fieldlabs: Living Lab Description*. European Network of Living Labs: Available online: <https://enoll.org/network/living-labs/?livinglab=urban-management-fieldlabs> (accessed on 24 July 2020).
- Juujärvi, Soile, and Virpi Lund. 2016. Enhancing Early Innovation in an Urban Living Lab: Lessons from Espoo, Finland. *Technology Innovation Management Review* 6: 17–26. [CrossRef]
- Krames, Jeffrey. A. 2001. *The Jack Welch Lexicon of Leadership: Over 250 Terms, Concepts, Strategies & Initiatives of the Legendary Leader*. New York: McGraw-Hill Professional Publishing.

- Lami, Isabella M., and Stefano Moroni. 2020. How Can I Help You? Questioning the Role of Evaluation Techniques in Democratic Decision-Making Processes. *Sustainability* 12: 8568. [CrossRef]
- Marion, Bruno. 2015. How Can Chaos Theory Help Us toward the Emergence of a New Civilization? *World Future Review* 7: 213–23. [CrossRef]
- Martin, Douglas. 2006. Jane Jacobs, Social Critic Who Redefined and Championed Cities, Is Dead at 89. *New York Times*, April 26.
- Mitleton-Kelly, Eve. 2003. Ten principles of complexity & enabling infrastructures. In *Complex Systems and Evolutionary Perspectives of Organisations: The Application of Complexity Theory to Organisations*. Amsterdam: Elsevier, pp. 23–50.
- Morag, Gilad. 2014. Tel Aviv Wins World's Smartest City Award. Available online: <https://www.ynetnews.com/articles/0,7340,L-4594114,00.html> (accessed on 21 July 2020).
- Müller, Bernhard, Paulina Schiappacasse, Jianming Cai, Enpu Ma, and Qirui Li. 2019. *Theoretical Aspects of Transition towards Urban Sustainability and the Role of Socially Integrative Cities*. Deliverable D.6.6 of the EU Project Transition towards Urban Sustainability through Socially Integrative City. Report D.6.6. Dresden: Leibniz Institute of Ecological Urban and Regional Development.
- Otto, Magdalena. 2020. Governing through Participation. In *Urban Change and Citizenship in Times of Crisis: Volume 2: Urban Neoliberalisation*. Edited by Bryan S. Turner, Hannah Wolf, Gregor Fitz and Jürgen Mackert. London: Routledge.
- Pallot, Marc, and Kulwant Pawar. 2012. A Holistic Model of User Experience for Living Lab Experiential Design. Paper presented at the 18th International ICE Conference on Engineering, Technology and Innovation, Munich, Germany, June 18–20. [CrossRef]
- Pasher, E., G. Pross, U. Kushnir, and Y. Neeman. 2017. Tel Aviv: A Renaissance Revival in the Making. In *Entrepreneurial Renaissance*. Edited by Piero Formica. New York: Springer, pp. 81–88.
- Pasher, Edna, and Tuvia Ronen. 2011. *The Complete Guide to Knowledge Management*. New York: John Wiley & Sons.
- Goldberg, Michal, Edna Pasher, and Maya Levin-Sagi. 2006. Citizen participation in decision-making processes: Knowledge sharing in knowledge cities. *Journal of Knowledge Management* 10: 92–98. [CrossRef]
- Pasher, Edna, Otthein Herzog, Mor Harir, Yaara Turjeman-Levi, and Zhiqiang Wu. 2018. Creating and enabling ecosystems for open innovation: Challenges and how to overcome them. In *Exploring the Culture of Open Innovation*. Bingley: Emerald Publishing Limited, pp. 201–18.
- Pierson, Jo, and Bram Lievens. 2005. Configuring Living Labs for a 'Thick' Understanding of Innovation. In *Ethnographic Praxis in Industry Conference Proceedings*. Oxford: Blackwell Publishing Ltd., vol. 2005, pp. 114–27. [CrossRef]
- Prahalad, Coimbatore K., and Venkat Ramaswamy. 2004. Co-Creation Experiences: The Next Practice in Value Creation. *Journal of Interactive Marketing* 18: 5–14. [CrossRef]

- Schaffers, Hans, Mariluz Guerrero Cordoba, Patrizia Hongisto, Tünde Kallai, Christian Merz, and Johann van Rensburg. 2007. Exploring Business Models for Open Innovation in Rural Living Labs. Paper presented at the IEEE International Technology Management Conference (ICE), Sophia Antipolis, France, June 4–6; pp. 1–8.
- Shechter, Liora. 2020. Interview with Liora Shechter CIO of Tel Aviv Municipality. Available online: <https://intelligent-cities-community.com/t/interview-with-liora-shechter-cio-of-tel-aviv-municipality/140/2> (accessed on 24 July 2020).
- Marvin, Simon, and Jonathan Silver. 2016. The urban laboratory and emerging sites of urban experimentation. In *The Experimental City*. Edited by James Evans, Andrew Karvonen and Rob Raven. London: Routledge.
- Smith, Wendy K., and Michael L. Tushman. 2005. Managing strategic contradictions: A top management model for managing innovation streams. *Organization Science* 16: 522–36. [CrossRef]
- Steen, Kris, and Ellen van Bueren. 2017. The Defining Characteristics of Urban Living Labs. *Technology Innovation Management Review* 7: 21–33. [CrossRef]
- Taleb, Nassim Nicholas. 2005. *Fooled by Randomness: The Hidden Role of Chance in Life and in the Markets*. New York: Random House Incorporated, vol. 1.
- Tel Aviv. 2020. About the City-Tel Aviv Smart City. Available online: <https://www.tel-aviv.gov.il/en/abouttheCity/Pages/SmartCity.aspx> (accessed on 23 July 2020).
- van Bijsterveldt, M. 2016. Living Labs. Ruimtelijke Adaptatie. Available online: <https://ruimtelijkeadaptatie.nl/living-labs/> (accessed on 2 August 2016).

Enhancing Capacity Building for Urban Transformation as a Means to Close the Planning–Implementation Gap in Europe and China [†]

Susanne Meyer, Christoph Brodник, Gudrun Haindlmaier,
Hans-Martin Neumann, Daiva Jakutyte-Walangitang, Jianming Cai, Yan Han
and Jing Lin

[†] This book chapter is based on two deliverables of the Trans-Urban-EU-China Project by the same author team: (Neumann et al. 2018, 2019) (see list of references). Strong text references to these deliverables are given in the book chapter.

1. Introduction

China has experienced unprecedented rapid urbanisation process in the past three decades, while, at the same time, encountering and facing a series of big challenges such as fast urban population growth, acute industrial restructuring, limited environmental carrying capacity, wide environmental degradation and less well-coordinated governance due to the conflicts of interest from different stakeholders (Neumann et al. 2019). In terms of a city's routine operation and daily management, the emerging "urban diseases", such as air pollution, traffic congestion, inadequate public services and other problems, pose additional challenges to the government's adoptive capacities in urban management and governance (Xu and Zhu 2020). All these challenges call for new approaches for urban development and transformation of the static type of urban management into a more dynamic and real-time adaptive practice (Neumann et al. 2018). Therefore, the rise in Smart City development is logically becoming a paramount and urgent need in China's new round of urbanisation and city development, where the quality- and human-centred development approach is fully promoted and further emphasised to eventually develop socially integrative cities (Li 2012; Shen 2010; Sun 2013; Zhen and Xiao 2014).

However, due to the top-down governance structures in China, at least for now, it is still the central and local governments that play the dominant role in Smart City development and practice (Shen 2010; Sun 2013). While progress is being made in distinct cases, showcasing experimental and pioneering examples of sustainable urban development, systematic, collectively shared urban visions, followed by spatially embodied, well aligned and integrated implementation actions, are still scarce and occasional. Strategies that were partly, or not at all, implemented

do exist in cities in China (Xie et al. 2015), as well as in Europe. This mismatch between planning in a strategic sense (conducted by decision-making authorities; taking place both on the national and local levels) and the implementation of actions leads to inefficient use of resources and local potentials, failing processes, lack of alignment, missing knowledge transfer and missed synergies, as well as lock-ins and frustration among the involved stakeholders. Consequently, there is an urgent need to close this gap. We argue that a set of transformative capacities within cities can narrow the planning–implementation gap in cities by interlinking the strategic perspective with specific implementation efforts to address the (local) challenges in an effective way and induce long-term transformative change.

The main aim and contribution of this research is:

- operationalising and applying an analysis framework to the European and Chinese context to measure transformative capacities to address the planning–implementation gap of cities;
- exploring and illustrating innovative approaches based on case studies to bridge the gap between strategic development and integrated planning and implementation in Europe and China.

The article is structured as follows. A literature review in Section 2 explores the scientific discussion on the planning–implementation gap, and introduces the conceptual framework on the transformative capacities of cities as an approach used in the article to study innovative approaches to narrow the planning–implementation gap and the smart cities approach, as this approach is used for the empirical case studies. Section 3 describes the methods used. It describes the analytical framework to measure transformative capacities and the case study approach. Section 4 describes the results of the case studies in China and Europe and Section 5 includes a reflection on innovative approaches to address the planning and implementation gap and outlines further research.

2. Literature Review

In this section, a literature review is provided to: (1) the planning–implementation gap; (2) transformative capacities in cities as a means to address the planning implementation gap; (3) the smart cities’ planning approach in China and Europe.

2.1. Planning–Implementation Gap

Researchers have been dealing with the problems of implementation processes for decades (Pressman and Wildavsky 1973; Gunn 1978). Earlier work saw a top-down policy as the ideal type for effective policy implementation. The approaches of the early 1980s (Lipsky 1980) see the so-called “street level bureaucrats” as

the key to successful or failed implementation and implementation must not be separated from policy-making. Recent approaches consider the political context much more comprehensively, since implementation will be influenced by complexity and unpredictability (Braithwaite et al. 2018), and the possible solutions vary according to the local context (Rittel and Webber 1973).

For decades, the normative top-down policy has been criticised as being based on three questionable elements: a chronological order in which expressed intentions precede action, a linear causal logic whereby goals determine instruments and instruments determine results, and a hierarchy within which policy formation is more important than policy implementation (Hill and Hupe 2015). Understanding has increased that the success of policies is not self-evident, and governments must do more to ensure that the results are implemented (Hudson et al. 2019).

In parallel, urban qualities are strongly influenced by social, environmental and technical changes, and urbanisation and traditional planning methods can no longer satisfy the growing demands for sustainable urban planning with regard to factors such as complexity, problem size, and level of detail, and these limitations make the development of new approaches necessary. More flexible and iterative planning approaches must focus more on participatory actions, implementation and see the city as a dynamic, complex system consisting of stocks of resources and flows of networks, e.g., through links to budgets, projects and a citywide or regional infrastructure (Kunze et al. 2011; Healey 2007; Innes and Booher 2018).

Many cities are currently confronted with fundamental challenges, such as rapid urban growth due to migration, environmental pollution, and social fragmentation. They look for unconventional solutions to manage and eventually overcome these challenges, by unlocking their innovative potential and encouraging niche innovations. Furthermore, they establish new institutional structures, practices and modes of action, which have a greater potential to successfully lead to more sustainable urbanisation (Frantzeskaki et al. 2019; Loorbach et al. 2016; Wolfram 2016; Wolfram and Frantzeskaki 2016; Neumann et al. 2018; Neumann et al. 2019).

A fundamental question arises in the context of this debate: whether new approaches to strategic planning, as well as to implementation, inherently contain a gap. Is the gap between the conventional paths of practice and novel urban strategic “push” potentially necessary to fuel and drive the process of innovation and advancement?

2.2. Transformative Capacity Building in Cities

Our hypothesis is that whether urban transition emerges or accelerates to close the planning–implementation gap depends, to some extent, on the urban transformative capacity as a prerequisite for long-term transformative change. According to Walker et al. (2004), transformability, as such, is the capacity to create a fundamentally new

system when ecological, economic, or social structures make the existing system untenable. Similarly, Loorbach et al. (2016) relate the term “transition” to “locked-in regimes that are challenged by changing contexts, ecological stress and societal pressure for change as well as experiments and innovations in niches driven by entrepreneurial networks, and creative communities and proactive administrators” (Loorbach et al. 2016, p. 2). Transformative change from unsustainable to sustainable development paths can be seen as multi-actor processes, which entail interactions between social groups (Geels 2010).

We look specifically into urban transformative capacities to respond to the planning implementation gaps in smart cities. Transformative capacities take many forms and there is no “one size fits all” approach. The term “transformative capacity” originates from sustainability science, more specifically from the transition management discourse. In this scientific context, “transition” refers to discussions and practical applications with the aim of promoting fundamental and lasting changes in urban societies regarding the path to sustainable development (Neumann et al. 2019; Wolfram 2016; Wilson et al. 2013; Ziervogel et al. 2016) have started to define transformative capacities and identify structuring elements. According to Wolfram (2016), transformative capacity can be defined as the “collective ability to conceive, prepare for, initiate and perform path-deviant urban change, thus enabling future development within planetary boundaries”. Wolfram (2016) suggested an integrated framework to inform analytical as well as intervention approaches. The framework maps out 10 interdependent key components grouped into three clusters (agency and interaction forms, core development process and relational dimension) (Figure 1). Crucially, this framework refers transformative capacity to urban stakeholders, places, and processes—both as a capacity source and a subject of transformation. Wilson et al. (2013) identifies similar elements of transformation (identity, feedbacks, structures and functions). The identity of the system, as well as the feedback element, which includes the interaction between people, institutions, and the environment, maps towards the “agency and interaction forms” of Wolfram (2016), the function of which includes the outcomes of the process maps towards the “core development process” and the structure, which includes relationships between the elements or parts of a system mapped towards the “relational dimension”. Ziervogel et al. (2016) outline that cultivation of transformative capacity includes: (1) an awareness of and a re-connection to life-support systems (collaborative co-creation); (2) a well-developed sense of agency (creativity); (3) social cohesion (relatedness, growing community). Awareness and collaborative co-creation include many elements of the core development process, social cohesion and relatedness includes many elements of the relational dimension and the agency element maps towards the agency and interaction forms of Wolfram. However, Ziervogel et al. (2016) and Wilson et al. (2013) look specifically at transformative capacities for sustainable system change,

whereas Wolfram operationalised his framework more specifically towards urban changes. For the investigation of urban transformative capacities, the framework of Wolfram seems most appropriate, as it includes elements highlighted by other researchers for transformative capacities, but, at the same time, was specifically developed for the urban context.

3 Categories	10 Key Components
Agency and interaction forms	<ul style="list-style-type: none"> - Inclusive and multiform urban governance - Transformative leadership - Empowered and autonomous communities of practice
Core development processes	<ul style="list-style-type: none"> - System(s) awareness and memory - Urban sustainability and foresight - Diverse community-based experimentation with disruptive solutions - Innovation embedding and coupling
Relational Dimensions	<ul style="list-style-type: none"> - Reflexivity and social learning - Working across agency levels - Working across political-administrative levels and geographical scales

Figure 1. Transformative capacity concept. Source: Wolfram (2016, pp. 127–28), used with permission.

Pathways towards transition for integrative planning on the level of strategy, neighbourhood planning and implementation can be derived based on the understanding of transformative capacities and the building of such a capacity by Wolfram (2016). Wolfram et al. (2019) indicated that further research is needed to obtain complementary insights into how such multi-agency and co-production processes emerge and unfold in different global contexts, urban domains, and places. This research addresses Wolfram’s call for empirical research into transformative capacities in a global context.

2.3. Smart Cities Planning Approach

Smart Cities is an innovative planning approach in China and Europe to address the current challenges, as outlined in the introduction. The Smart City concept has been prominently promoted in China and Europe and has received attention from the city authorities. In both Europe and China, the Smart City concept is mainly driven by the policy level. Although there are differences in the understanding of Smart Cities in China and Europe, cities in both are considered smart if they use technological solutions to improve the management and efficiency of the urban environment.

How the term “smart city” should be defined, and how this definition can be operationalised to measure progress in smart city development, has been broadly discussed among academics (Neumann et al. 2015; Huovila et al. 2017). In this article, however, we do not refer to any specific academic definition, but focus on what funding agencies and other owners of relevant funding and financing programmes

call the “smart city”. These include, on the European side, the Smart Cities and Communities initiative within Horizon 2020, the Joint Programme Initiative Urban Europe and the European Territorial Cooperation Programme URBACT. On the Chinese side, we refer to the initiatives “National Smart City Pilots” (NSCP) of the Ministry of Housing and Urban Development (MOHURD), “Smart City Cloud Platform for Spatio-Temporal Information” (NSCP) of the National Ministry of the National Administration of Surveying, Mapping and Geo-information (NASMG), the “National Information Consumption City (NIC) Pilot Program” of the Ministry of Industry and Information Technology of PRC (MIIT), the “Technology and Standard Pilot Program for Smart City (TSPPSC) Construction” of the Ministry of Science and Technology (MOST), and the People-Beneficial-Oriented National Information Cities (NIPC), an initiative that has been jointly funded by several national ministries and bureaus.

At the European level, Smart City programmes are one of the key initiatives through which European cities are bringing forward technological innovation and fighting climate change (European Commission, and UN Habitat 2016, p. 179). Smart Cities have been supported through various EU instruments, such as European Structural and Investment Funds, European Research and Innovation Programme and the European Innovation Partnership on Smart Cities and Communities (European Innovation Partnership on Smart Cities and Communities 2013) since 2013. These instruments support the aims of the energy union (European Commission 2015) and the Urban Agenda for the EU (European Commission 2016). For example, the European Research and Innovation Programme entails an annual call on Smart Cities and Communities. This call finances the large-scale demonstration of replicable solutions in the context of cities. The focus of all projects is on the innovative application, testing and validation of already existing technologies or technologies in neighbourhoods, rather than on the development of new technologies (Gaiddon et al. 2016). Additionally, many Member States in Europe have additional strategic policy documents and respective funding programmes.

Compared with Europe, smart city construction in China faces a more complicated situation and has attached greater strategic significance to urban development in an aim to cope with the challenges associated with the increasing speed of the urbanisation process and induced by irrational urban expansion: i) the increasing pressure on resources and ecological environment in the context of the rapid growth of the urban population; ii) insufficient inter-department coordination and inefficiency in urban management; iii) incompatibility between traditional production/management techniques and the increasingly emphasised demands for innovation, governance and sustainability (Wu 2013). The development and application of IoT, cloud computing, big data, and other emerging IT technologies is regarded by policy makers as a key instrument and solution for mitigating, or even

cleaning, the various incurred urban diseases, and thus having higher motivations and expectations for Smart City development. As a consequence, various levels (state, provincial, municipal, etc.) of government-initiated and -led pilot cities/projects have become the backbone and most powerful organisational form for China's Smart City construction. This government-led pattern has further catalysed and stimulated the enthusiasm of all sectors of society. At present, the focuses of Smart City construction projects in the state mainly include: (i) interconnected smart infrastructure systems, (ii) highly-coordinated urban governance and civil service, and (iii) technology embeddedness, based on multi-application scenes (Huang et al. 2020). There are many stakeholders actively participating in those programmes, such as enterprises, research institutions and universities (Shen 2010; Sun 2013). When it comes to the "soft" aspect, technologies are widely considered as tools of "technological empowerment" (Zheng 2007). Recently, public participation has been identified as an important starting point of pursuing "modernisation of state governance" (National Development, and Reform Commission 2013). Currently, the implementation of smart city projects (most of them with too-high technical entry barriers and too high a threshold for the public to engage in) is still focused on the short-term interest division between the government and enterprises. Nevertheless, some emerging possible patterns for public participation have been explored and practiced. For example, in the field of resource and energy supply (such as water, electricity, natural gas, etc.), by being embedded into the high-tech market, multiple actors, including the government, enterprises, and the public, can be involved in the participation process based on commercial networks (Chen 2020).

As the Smart City concept is being pushed in Europe and China at a strategic policy level, and additionally by funding instruments on the operational level, it is suitable to use Smart Cities to measure transformative capacity to narrow the planning implementation gap.

3. Methodology

A range of methodologies was selected and applied to gather empirical information on the transformative capacities of Smart Cities in eight European and Chinese city case studies to learn about innovative approaches to closing the planning–implementation gap (Figure 2).

First, an analytical framework to operationalise transformative capacities in Smart Cities has been developed (Section 3.1). This framework has been the basis for guiding questions in the city case studies. Second, a case study approach has been developed (Section 3.2).

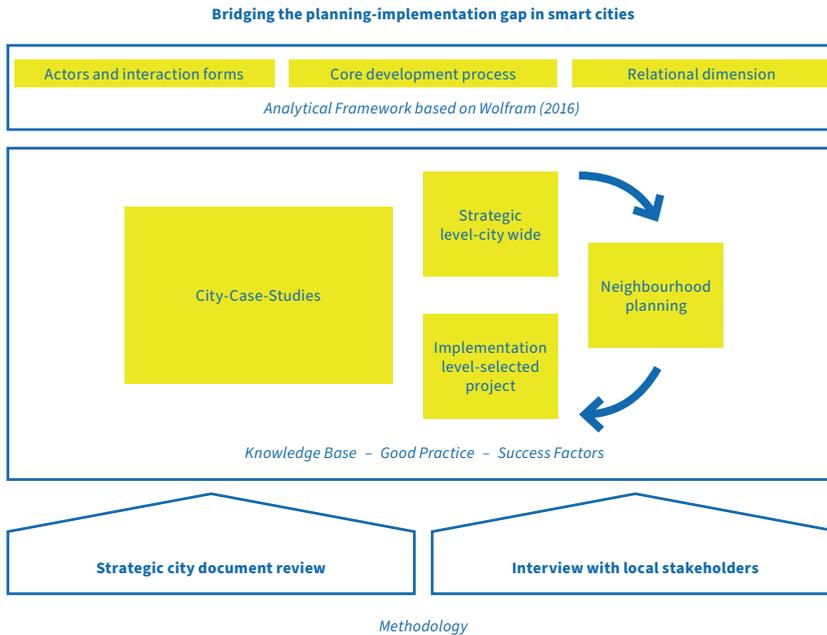


Figure 2. Case Study Approach. Source: Figure by authors.

3.1. Framework to Measure Transformative Capacities of Cities to Address the Planning–Implementation Gap

While the framework of Wolfram (2016) has been operationalised for application in specific public services sectors in cities previously (e.g., Brodnik and Brown 2018), it needed to be adapted to this research paper. To this end, the framework of Wolfram (2016) (see Section 2.2) has been applied and contextualised in the context of smart city development in China and Europe for planning and implementation purposes. We followed the methodological approach of Ziervogel et al. (2016) and applied the transformative capacity framework with the aim of identifying and mapping innovative activities and tools towards the dimensions and key components and aspects. The identification of activities should support the detection of transition pathways to close the planning–implementation gap in smart cities (Neumann et al. 2019). Based on the three dimensions and the key components, key aspects have been derived to identify activities that build transformative capacity, to narrow the planning implementation gap.

A framework has been developed to identify activities’ transformative capacities for a change in strategic planning, neighbourhood planning and implementation, to close the planning implementation gap in Smart Cities. Based on the three dimensions and the key components, key aspects (Neumann et al. 2019) have been derived to measure transformative capacity in the context of narrowing the planning

implementation gap in China and Europe (Table 1). As an example, the development of the key aspects will be illustrated. *Transformative Leadership*, as a component of “Agency and interaction forms”, has been put into the context of Chinese and European smart city development. The following aspects and activities have been identified and covered in the city case studies:

- Who were the key actors in the smart city planning and implementation process? Who has taken leadership and ownership for smart city strategy making, planning and implementation?;
- What has been the personal and functional competences of key actors?;
- How has decision making for strategy, planning and implementation taken place and how transparent was the process? How (if at all) are implementation projects implemented in overarching strategic efforts?

At this stage, it has been assumed that all identified key aspects are relevant along the entire policy cycle for integrative planning spanning from (1) urban strategic planning, (2) neighbourhood planning, and (3) implementation (Figure 3). In order to generate empirical evidence on innovative activities and tools to build transformative capacities, interview guidelines for city case studies have been developed based on the key aspects (Section 3.2).

3.2. Case Study Approach

The case study approach¹ includes the identification and sampling of cities for case studies in China and Europe and the implementation of the case studies.

The selection approach for city cases considers smart innovation and implementation projects in China and Europe, which have successfully passed a selection process of one of the above-mentioned Smart City programmes and been implemented. These projects can, therefore, be seen as exemplary for the current state of smart city practice. All these projects aim to address the implementation of city strategies in an innovative way. Thus, they provide insights and learning material for others looking to close the planning implementation gap.

¹ A more detailed description of the case study approach can be found in the deliverable of the respective research project in (Neumann et al. 2019).

Table 1. Operationalisation of transformative capacity to close the planning–implementation gap in China and Europe.

Agency and interaction forms
<p><i>Inclusive and multiform urban governance</i></p> <ul style="list-style-type: none"> • Diversity of actors involved, resources of actors to become active and benefits of actor • governance structure, involved bodies and strategic alignment • Continuity of active actors across multi-level governance/bodies • Commitment for action and decision
<p><i>Transformative leadership</i></p> <ul style="list-style-type: none"> • Key actors, leadership and ownership • Personal and functional competences of key actors • Decision-making and transparency of decisions
<p><i>Empowered and autonomous communities of practice</i></p> <ul style="list-style-type: none"> • Continuity of commitment towards implementation by actors/community involved
Core development processes
<p><i>System(s) awareness and memory</i></p> <ul style="list-style-type: none"> • Cross sectoral integration in Strategy/Planning/Implementation
<p><i>Urban sustainability and foresight</i></p> <ul style="list-style-type: none"> • Common vision of all actors at the beginning of the strategy process, or the strategy itself as a reaction to existing problems/symptoms • Alignment and orchestration of vision, strategies, planning and implementation • Alignment of strategy with national and international strategies
<p><i>Diverse community-based experimentation with disruptive solutions</i></p> <ul style="list-style-type: none"> • Opportunities for experimentations and testing • New solutions generated in the implementation phase
<p><i>Innovation embedding and coupling</i></p> <ul style="list-style-type: none"> • Innovative action and its embeddedness in strategy/planning/implementation
Relational dimensions
<p><i>Reflexivity and social learning</i></p> <ul style="list-style-type: none"> • Evaluation and monitoring from strategy to implementation • Learnings (positive and negative) among the active actors, integration of learnings in future processes/activities • Information/documentation of processes from strategy to implementation (transparency and process-oriented)
<p><i>Working across agency levels</i></p> <ul style="list-style-type: none"> • Experience/history of already existing cooperation • Solutions for emerging problems/conflicts through cross-sectoral activities
<p><i>Working across political-administrative levels and geographical scales</i></p> <ul style="list-style-type: none"> • City/actors' experience and exchange of know-how at national and/or international levels • Working across various departments in the city administration

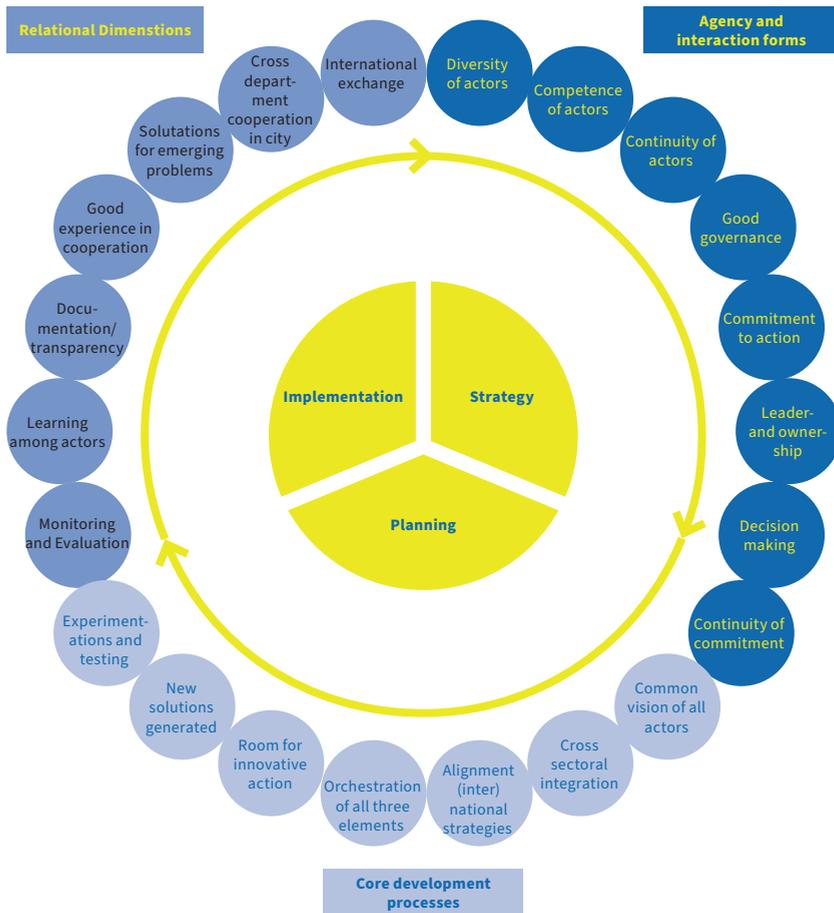


Figure 3. Analytical framework to assess transformative capacities in smart cities. Source: Figure by authors.

3.2.1. European Smart City Programmes and Selection of Cities for Case Studies

In Europe, the concept of smart cities has been widely used in city strategies, as it is rooted in European, national and regional policy strategies. Moreover, research and innovation programmes have been targeted towards smart city development to support technological, organisational and social innovations needed. The main aim is to support research and innovation needed for the implementation of smarter cities.

European R&I Programmes dedicated to urban development are the following:

- The first programme is the European research and innovation framework programme of the European Commission. In the 8th (Horizon 2020–2014–2020) R&I framework programme, cities have been actively mobilised to apply to projects dedicated towards the development of smart cities (but, also, other

types of city: digital city, eco-city, etc.). The projects considered for analysis started in the period 2013-04/2018.

- The second programme is the European URBACT III programme of the European Commission (2014–2020) that supports innovative activities in cities. Projects considered for analysis started in the period 2013-04/2018.
- The third R&I programme is the European Joint Programming Initiative Urban Europe that funds R&I projects dedicated to sustainable development on transnational basis. Projects considered for analysis started in the period 2013–2017.

For the selection of city cases an analysis of three large European/transnational R&I programmes has been conducted to identify cities actively involved² in such programs. (cf. Neumann et al. 2019). In total, 273 projects dedicated to sustainable urbanisation could be identified, with 161 participating cities, meaning city authorities/municipalities. A total of 213 out of 273 projects with city participation are funded by Horizon 2020, 33 projects by URBACT and 27 projects by JPI Urban Europe. Moreover, this reveals that the identified cities vary in size, from small (<50.000 inhabitants) to large (>1.000.000 inhabitants). Appendix A shows a map of Europe with the engaged cities in projects, according to the number of projects they are engaged with.

Based on the 161 cities, a sample was generated for case studies. The following sample criteria were applied: the active involvement of cities in the project generation, the number of projects cities are involved in, and the variety of programmes they are active in.

Table 2 summarises the sample criteria for cities (*column 1*), the selected cities according to the different sample criteria (*column 2*), and a first selection of 19 cities (*column 3*), where eliminated cities were sampled more than once. Based on this first selection, a second selection was made, reducing the sample by cities that had similar sample criteria (e.g., Vienna and Hamburg—both are active in three projects, and have similar size). In a further step, taking into account the availability of the contact persons and their availability for interviews, the number of cities was reduced to eight. Table 3 summarises the eight cities in Europe selected for case studies, their sample criteria and population size, and the number of projects they are involved.

² In our understanding, a city is actively involved in a programme if it is a partner receiving funding in one or several projects financed by the respective programme.

Table 2. Sample criteria and selection of European cities for case studies.

Sample Criteria	Cities	1st Selection #19 (Assumption: Different Type of Cities)	2nd Selection #8
Cities that are most active in projects across all funding schemes	Torino (7 projects), Santander (7 projects) Madrid (8 projects)	Amsterdam Antwerp	Amsterdam Budapest
Cities that are most active in H2020 projects	Torino (7 projects), Santander (7 projects) Madrid (8 projects)	Barcelona Bratislava Bristol	London Madrid Rijeka
Cities that are most active in URBACT projects	Ioannina (2 projects)	Budapest Dublin	Santander Stockholm
Cities that are most active in Joint Programming Initiative Urban Europe	Maastricht (2 projects), Amsterdam (2 projects)	Genova Hamburg	Vienna
Cities that are active in all three funding schemes	Antwerp, Stockholm	Ioannina Lisboa London	
Cities that are active in 3 or 4 of the city concepts	Santander, Torino, Genova, Dublin, Lisboa, Madrid, Barcelona, London, Bristol	Maastricht Madrid Rijeka Santander	
Cities with many projects, but from different planning background	Napoleonic: Torino (7 projects), Santander (7 projects) Madrid (8 projects) Eastern: Budapest (2 projects), Bratislava (2 projects), Rijeka (2 projects) Germanic: Vienna (3 projects), Hamburg (3 projects)	Stockholm Torino Vienna	

Table 3. Overview of city sample for European case studies.

City	City Population	Projects
1-3	500.001–1 Mio.	3
Amsterdam		
Budapest	>1 Mio.	2
London	>1 Mio.	9
Madrid	>1 Mio.	8
Rijeka	100.001–250.000	2
Santander	100.001–250.000	3
Stockholm	500.001–1 Mio.	3
Vienna	>1 Mio.	4

3.2.2. Chinese Smart City Programmes and Selection of Cities for Case Studies

The rapid and fast urbanisation in China in the past decades caused many serious challenges to Chinese urban development in a quantitative way, including less manageable urban sprawl, heavier pollution, and increasingly enlarged social disparity. Therefore, Smart City development is optionally becoming a paramount and urgent need in China's new round of urbanisation and city development. To scientifically explore the different approaches to the construction, operation, management, services and development of Smart Cities in the Chinese context, different ministries of the state council have launched a series of pilot programmes to encourage incorporating Smart City practices into urban development strategies, to enhance the management and service capability at city level, and thus to improve the process of urbanisation and of industrial restructuring, and to improve governance and public services towards sustainability. There are many stakeholders actively participating in those programmes, such as enterprises, research institutions and universities. However, due to the top-down governance structures in China, at least for now, it is still central and local governments that play the dominant role in city development and practice. Because of their nature, and considering the various level of government in China, it is preferred to start with pilot and demonstration cases to test any kind of new preferential policies and gain experience in developing the new type of city. It can be fairly and reasonably assumed that pilot cities in China (which usually receive more policy support from central government) are more likely to become the showcases for excellent performance in Smart City construction, while its real effectiveness needs to be further assessed and evaluated. But nevertheless, these pilot cases are still valuable references for understanding the Chinese approach in this regard and are a good entry point for international comparative studies.

The following Pilot Programmes dedicated to Smart City construction in China were launched by Chinese government ministries or agencies. More information for each programme is provided in Appendix B. They are used for identifying the cities that are more active in Smart City development:

- In May 2012, the Ministry of Housing and Urban-Rural Development of the PRC (MOHURD) issued a Notice on Carrying Out the National Smart City Pilot Programme (NSCP).
- In Dec 2012, the National Administration of Surveying, Mapping and Geo-information (NASMG) announced the launch of a pilot programme of constructing Smart City's Cloud Platform for Spatio-Temporal Information (CPSI).
- In Dec 2013, the National Information Consumption City (NIC) Pilot Programme was launched by the Ministry of Industry and Information Technology of PRC (MIIT).

- The Technology and Standard Pilot Programme for Smart City (TSPPSC) Construction was jointly issued by the Ministry of Science and Technology of the PRC (MOST) and the Standardization Administration of China (SAC) in 2012.
- In 2014, 12 national ministries or bureaus (D12) jointly approved a list of 80 cities for pilots of People-Beneficial-Oriented National Information Cities (NIPC).

In total, 1028 pilot projects on smart city construction in China exist to date, distributed to 193 cities (including 189 prefecture-level cities and four provincial-level municipalities) of 31 provinces. Appendix C presents a map of all identified cities. Among them, 527 pilot programs are related to Smart City development, discussed above. The other 501 pilot programmes launched by the central government on city development will not be used for further comparative study, given that there are no such data from the European side. Corresponding to the sample criteria of European cases, Table 4 shows the criteria and process of selection for case studies in China based on the 193 pilot cities identified above, including the sample criteria for cities (Column 1), the primary selection according to different sample criteria (Column 2), the first selection of 17 cities after removing those cities that have been sampled repeatedly (Column 3), and the final identification of eight cities in consideration of both heterogeneity of the sampling criteria (cities are both active in carrying out Smart City and Eco-City pilot programs) and comparability with European cases (Column 4) in terms of Smart City development.

Table 5 shows the basic information and characteristics for the eight identified cities for further international comparative studies, including the sampling criteria, city clusters to which they respectively belong, resident population of 2016 and programmes they are involved in. In China's domestic urban system: i) Beijing, Shanghai, Tianjin, Chongqing, Shenzhen, and Wuhan are Megacities (cities with an urban resident population more than 10 million), representing an intensive, innovative, international and integrated form of settlement in the 21st century; ii) Suzhou and Dalian are Big Cities (the urban resident population is between 1 million and 5 million). Their scale and influence could reach a relatively high level, but emerge with the bottleneck of upgrading the quality of urban development. According to the World City Ranking (2020) report, published by GaWC, Shanghai, Beijing, Guangzhou, and Shenzhen are categorised as first-tier world cities (Alpha), Tianjin, Wuhan, and Dalian as the second-tier (Beta), while Suzhou is categorised as the third-tier (Gamma).

Table 4. Sampling criteria and selection of exemplary Chinese cities for case studies.

Sampling Criteria	Cities	1st Selection #17 (Assumption: Different Type of Cities)	2nd Selection #8
Cities that are most active in Smart City and Eco-city pilot programmes	Suzhou (19 projects), Chongqing (16 projects), Weifang (16 projects), Beijing (16 projects), Qingdao (14 projects), and Hangzhou (13 projects)	Beijing Chongqing Dalian	
Cities that are most active in Smart City pilot programmes	Beijing (13 projects), Qingdao (9 projects), Suzhou (8 projects), Chongqing (8 projects), Weifang (8 projects), Tianjin (8 projects)	Fanyang Hangzhou Ningbo Qingdao Shanghai Shenzen	Shanghai Chongqing Beijing Wuhan Dalian Suzhou Shenzhen Tianjin
Cities that are most active in NSCP	Beijing (11 projects), Tianjin (6 projects), Qingdao (6 projects), Suzhou (6 projects),	Suzhou Tianjin Weifang Wuhan	
Cities that are most active in NIC	Shanghai (3 projects)	Xianyang	
Cities that are active in all 5 Smart City pilot programmes	Dalian, Xiangyang,	Xi'Ning Yichang Zhengzhou	
Cities that are active in 4 Smart City pilot programmes	Wuhan, Shenzhen, Zhengzhou		
Cities that are active in different pilot concepts	Garden City: Weifang, Suzhou, Shanghai		
	Ecological Garden City: Suzhou		
	Climate-smart City: Chongqing		
	Sponge City: Xining		
Cities with many pilot projects by city clusters	Low-carbon City: Wuhan		
	Yangtze River Delta: Suzhou (19 projects), Hangzhou (13 projects), Ningbo (12 projects), Shanghai (11 projects)		
	Middle-Yangtze River: Wuhan (9 projects), Xiangyang (7 projects), Yichang (7 projects)		
	Shandong Peninsula: Weifang (16 projects), Qingdao (14 projects)		
	Zhongyuan: Zhengzhou (8 projects)		

Table 5. Characteristics of the eight exemplary Chinese cities for further comparative studies.

City	City Cluster	Urban District Population	Projects
Shanghai	Yangtze River Delta	20 Mio.–30 Mio.	11
Chongqing	Chengdu-Chongqing	20 Mio.–30 Mio.	16
Beijing	Beijing-Tianjin-Hebei	20 Mio.–30 Mio.	16
Wuhan	Middle-Yangtze River	5 Mio.–10 Mio.	9
Dalian	Harbin-Changchun city cluster	2.5 Mio.–5 Mio.	11
Suzhou	Yangtze River Delta	2.5 Mio.–5 Mio.	19
Shenzhen	Pearl River Delta	10 Mio.–20 Mio.	6
Tianjin	Beijing-Tianjin-Hebei	10 Mio.–20 Mio.	12

3.2.3. Implementation of City Case Studies

City case studies have been conducted to gather empirical information from a variety of stakeholders involved in the planning and implementation of smart city projects. The city case studies included:

- development of a guiding questions related to each key aspect of the analytical framework to be followed during the empirical data collection for each city case study;
- desktop research on strategic and planning documents and potential implementation areas;
- interviews with selected stakeholders from the strategy, planning and implementation phase;
- analysis of empirical data and development of a city case study according to a template oriented towards the analysis framework.

The city case studies shall exemplify the argument of this book chapter and support the story-telling. Eight case studies in Europe and China were aimed for. Two case studies could not be realised in Europe (Amsterdam, Rijeka). The main reasons for not realising the case studies are no access to or response from adequate interview partners, interview partner rejected interview due to limited English language capabilities, and limited information on city strategy/implementation available in English language.

4. Results—Case Analysis: Building Transformative Capacities in European and Chinese Cities to Close the Planning and Implementation Gap

This section highlights different exemplary measures to increase the transformative capacities of cities that have contributed to a better alignment of city planning and implementation. Detailing the specificities of all empirical cases is beyond the limitations and scope of this book chapter. Instead, we present a selection of the most innovative approaches for building the transformative capacities found in the Chinese and European cases. The illustrations from the European cases are described individually because the cases were highly specific, demonstrating the idiosyncrasies of European city planning and implementation frameworks. Each city in Europe has its own exploration and implementation of the smart city approach based on its institutional context und planning culture. In China, the implementation approach is mainly a top-down process, usually based on a pilot experiment. This pilot experiment is usually taken by a megacity, given its strong financial capacity and comprehensive situation, so the pilot projects are successful in most cases. Once a successful case is gained, a quick upscaling can be promoted and implemented to other cities with a large scale of replication. The replication can then form a cluster of cities, which use similar tools and instruments in their implementation in China.

Illustrations from the Chinese cases are subsumed when multiple cases exemplified a set of related transformative capacity-building measures.

4.1. Building Transformative Capacity in European Cities

Stockholm (Sweden) demonstrates several measures that support and sustain the different transformative capacity domains across the entire policy cycle. In particular, Stockholm highlights measures that increase the diversity of actors (domain: “Agency and Interaction Forms”), as well as a common vision and orchestration of vision, strategies, planning and implementation (domain: “Core Development Processes”) and measures that aim to work across various departments in the city administration, Evaluation and Monitoring and collective learnings among the active actors (domain: “Relational Dimensions”).

For example, Stockholm has co-developed a common long-term vision for Stockholm with a range of stakeholders. Stockholm sees this vision as a commitment to sustainable development at the highest strategic level. The vision was developed together with various city departments, companies and external partners and was led by the City Executive Office. The development of this vision also entailed a comprehensive citizen engagement process, which consisted of information events, communication initiatives and public exhibition phases, where people were informed about the status of the strategic document and given the opportunity to provide feedback and voice their ideas. Importantly, the overarching vision for Stockholm frames the various other strategies and anchors different urban development projects in a widely shared and democratically legitimised strategic direction. The merit of this measure is that it helped to create an overarching and shared agenda and collective energy for realisation in practice. Furthermore, the benefit was that, by defining the long-term goal, the vision became a powerful tool to create alignment between other strategic documents of the city. For example, the Green IT Strategy of Stockholm 2009 is aligned with the Environment Programme 2008–2011 and the strategy for a fossil-fuel-free Stockholm by 2040 is aligned with the current Environmental Programme 2016–2019. Alignment was not only achieved between strategies, however, but also between documents at different strategic levels. As such, Stockholm managed to successfully translate strategic objectives into different city planning documents. For example, the Stockholm City Plan shows many connections to the various strategies and takes their diverse objectives into account. Additionally, civil contracts have been used in an innovative urban development project: The Royal Seaport Stockholm. At this development site, the city owns the land and sets the requirements for developers through civil contracts. The requirements for these land allocation contracts are strict and specify a range of environmental, social and economic targets that become elaborated and translated into development requirements in thematic working groups, which consist of experts from different

city administration units and private sector companies. The use of such forums creates a space and process for working across city departments and sectors in an interactive way. As such, breaking down targets into binding requirements is used as an opportunity and designed as a process that brings otherwise separate groups together. Through a carefully facilitated series of workshops, a lively dialogue between private and public stakeholders creates critical learning and reflection opportunities and establishes shared accountability. In turn, the commonly agreed targets and requirements create the basis for regular monitoring and evaluation, which is also structured through these interactive working groups. The frequent reporting of monitoring results with property developers creates a direct feedback on how the sustainability requirements work in practice. The continuous feedback mechanism that this creates provides significant input into how the sustainability specifications could be adapted and improved moving forward. Used this way, monitoring and evaluation, in the form of a structured dialogue, becomes a central part of the development process, which enables learning, as well as the transfer and documentation of experience gained from the project as the implementation proceeds. For each year, the Stockholm Development Administration reports the results of the property developers and how the project contributes to the city's overall planning and implementation framework. The sustainability report and the monitoring reports are aimed at widely disseminating these lessons learned within the city and to all external stakeholders that are not directly involved with the Royal Seaport Project. The benefits of these measures lie in their ability to create accountability while engaging stakeholders in a feedback process that strengthens learning and collaboration.

In terms of transformative capacities, London (United Kingdom) exemplifies strong measures around the diversity of actors, appropriate key actors, leadership and ownership, as well as the continuity of active actors across multi-level governance/bodies, decision making and transparency of decisions (domain: "Agency and Interaction form"). London also exemplifies other capacity-building measures, such as orchestration of vision, strategies, planning and implementation (domain: "Core development process"), as well as evaluation and monitoring (domain: "Relational Dimension").

In terms of inhabitants, London is one of the biggest cities in Europe and one of its economic hotspots. It is also one of the frontrunners in the European Smart City arena. London has a governance system which strengthens the role of local governments at the district (so-called "boroughs") level. London's governance system is characterised by the coexistence of the Greater London Authority (GLA), which is led by the Mayor of London, and 33 boroughs, each of which has its own council and administrative system.

The boroughs are responsible for most of the daily operations of the city, while the role of the GLA is, to a large extent, coordination. As the GLA itself has very limited resources and competences for implementation, the GLA acts as a facilitator, while the boroughs play a key role in the implementation on the ground. Leadership and ownership in the smart city development are well-defined. The Smart City team of the GLA sees itself as the advocate of the citizen in the digital transition process. This includes ensuring that citizens have effective means of recourse to safeguard their rights against technology providers in case a technology fails or is used in an irregular way. London's smart city activities are clearly focused on the rollout of digital technology to improve the quality of life of the inhabitants and to stimulate the local economy. This was outlined in the "Smart London Plan" presented in 2013, which was followed in 2018 by the "Smarter London Together" roadmap. This roadmap defines priorities (so-called "missions") for the Smart City Development of London. Each of the missions is broken down into several actions. The roadmap and the actions are very well orchestrated. The Smart City Team of the GLA promotes the implementation of these actions. When building project-based partnerships with a diversity of actors, such as the boroughs, the top five local universities, the private sector and organisations of the so-called "mayoral family" (e.g., Transport for London, Police, Fire Brigade and the Cyber Security Agency), are an important vehicle for the implementation of the roadmap. As such, the measure is critical for coordination amongst a diverse set of stakeholders responsible for urban development issues at a strategic level. Furthermore, 13 boroughs have agreed to set up and co-fund the "London Office for Technology and Innovation" as a permanent institution to guide and steer the city-wide digital transition. Various projects of all sizes are currently being carried out and contribute to the implementation of the Smarter London Together Roadmap, with two of the most remarkable ones being the London Cybersecurity Strategy and the European Smart City Lighthouse Project Sharing Cities. For the sake of transparency and progress monitoring, the status of all implementation projects is permanently shown on a publicly accessible Trello board. This gives an indication of the character of the Smarter London Together Roadmap: it is not static, but was set up as a living document that undergoes regular monitoring and updating to ensure that emerging issues can be addressed effectively. As such, the measure supports transparency, increases the legitimacy and improves public perception of the implementation projects.

Santander (Spain), exemplifies how a diversity of actors can continuously be involved, from smart-city-planning to implementation (domain: "Agency and interaction"). It also shows that close collaboration across the different departments (domain: "Relational Dimension"), to develop a smart city, was a success factor.

The Santander case study highlights that smart city development was strongly led by the university. The municipality and the private stakeholders were critical

enablers for collaboration across the different departments, which was possible because of the “small-scale” project (a rather small city with 170,000 inhabitants in the north coast of Spain). Furthermore, the involvement of various actors in a continuous manner had been a crucial factor, as the city has been in touch with many internal stakeholders (for example, individuals, service providers, operators, or entrepreneurs) as well as external stakeholders (such as the World Bank, etc.). In terms of building individual and organisational capacities, training was necessary for the municipality, and appreciated by the city actors, to build transformative leadership. Overall, the measure helped to create continued commitment and a collaborative approach between different stakeholders from the early planning phase until project implementation.

Madrid (Spain) provides examples for measures of transformative leadership and inclusive urban governance (domain: “Agency and interaction forms”). It is also an example of how cities can take up opportunities for experimenting and testing (domain: “Core development processes”) not only of new technologies, but also new forms of urban governance and the importance of facilitating learning among the active actors (domain: “Relational dimensions”).

The Madrid case study shows innovative ways of dealing with crisis and approaching multiple funding options (e.g., exchange of properties between city, private property owners and a football club to allow the realisation of a large implementation project), as well as developing local, tailor-made solutions (due to a lack of regional and national (direct) support). A crucial factor for bridging the gap between the strategy by the city and its implementation was intensive efforts to build trust between city actors and citizens from the scratch (no “culture of participation” so far), as well as trying to create “ownerships” of multiple small-scale implementation measures by various stakeholders. As such, the measures created the necessary relationship between key stakeholders over time, and other resources required for smart city project implementation.

4.2. Building Transformative Capacity in Chinese Cities

Across all six Chinese case studies (i.e., Beijing, Shanghai, Shenzhen, Wuhan, Chongqing and Tianjin), a prominent aspect of transformative capacity building is leadership and ownership (domain: “Agency and interaction forms”) as the process of smart city development follows a top-down government approach.

The most successful factor in the promotion of smart city construction in China is the top-down government-dominated development approach. Leadership and ownership of the process is strongly hierarchically organised. This approach is further magnified by the deep hierarchy in government organisation in the country. The vertical hierarchy of governmental structure in China is a “top-down dominated structure”, in which upper-level governments have

the dominate/decisive power in policy/regulation supervision and implantation monitoring/evaluation through controlling the allocation of personnel, investment, and the administration of lower-level governments, although, in reality, the decision-making and implementation process is a rather complicated course of power gaming case-by-case, and region-by-region in terms of “opinion expression - opinion collection—decision making - implementation”, as well as “monitoring - information feedback”. Particularly, along with the modernisation reform of the governance system and the transformation of government functions, coordination approaches for a vertical intergovernmental relationship are becoming increasingly popular in China. As illustrated in the above-mentioned smart city programmes, all the initiatives started from national governments or their affiliated agencies or bureaus, which allows the pilot city, from the very beginning, to be integrated into the national urban system and gain policy support and morale incentives, to carefully play the role of a experimental and demonstration case. The centralised leadership that the national government exerts also provides the pilot city with more flexibility and the ability to launch more customised policies based on their local settings. As such, leadership and ownership is a top-down advantage in all Chinese cases, which trickles down to lower levels of government and can, for example, effectively empower the municipal leadership in their implementation of new plans with high efficiency, and meanwhile allow the municipal government to reflect local characteristics.

The merit of this measure in narrowing the planning–implementation gap in China lies in the fact that the strong government leadership secures the legal status of planning and its authority, while, as owner of the plan, the government’s constant monitoring process enhances the implementation effectiveness.

Aligned with the top-down approach, another successful factor in China in closing the planning implementation gap is to have a government-led and dominated strategic visionary designing with a series coordinated consistent plans for orchestration across various case studies (domain: “Core development process”) to make sure that different sorts of plans can be integrated and reinforced as much as possible.

To realise various objectives based on the changing socio-economic needs, there are various plans in urban China. The most notable plans include the five-year socio-economic plan, which focuses on sectorial development and long-term vision in overall structure changes; the urban territory land-use plan, which focuses on the land quota distribution of functional areas over the planned time period; the city masterplan, which deals with the functional division of land use and design of construction land within the urban proper; the environmental protection and ecological construction plan, which focuses on the improvement in the urban eco-environment and various thematic plans, such as smart-city planning, urban

agriculture planning, which focuses on dealing with specific issues, usually incurred by special national programmes. Because of the diversified objectives of different plans, the key to successful implementation is to keep the various plans with consistent principles and guidelines for better orchestration from strategy to implementation. Shenzhen and Wuhan cases show that, to facilitate coordination between different plans, cities in China usually establish a special commission to maximise the representativeness of different stakeholders, such as government agencies, research institutions, enterprises and civil society, and set up a working office to facilitate the implementation process.

The effectiveness of this measure is that, based on city-wide discussion, the government sets the visionary strategy to the whole municipality while allowing involved institutions and stakeholders to have their own actions, maintaining the consistent coordination among high-level government, while maintaining flexibility for lower-level actors to play their initiatives.

The case studies of Shanghai, Shenzhen and Wuhan show that a diversity of urban actors are involved in the different planning and implementation stages (domain: "Agency and interaction forms"), to ensure commitment to implementation.

A government-led multi-stakeholder partnership is increasingly becoming a new fashion in the planning and implementation process in China, and is attributed to the successful actions. Under the lead of the special commission and working office, a larger partnership or stakeholder network will be formed to promote the whole process of planning and implementation. The typical partnership usually consists of relevant government agencies/department, research institutions and consultant companies, leading enterprises in the industry, and associated medium- and small-sized firms, to take full advantage of the top-down process for protecting the equality and bottom-up process when maintaining efficiency. Meanwhile, different stakeholders will play a key role in different planning and implementation stages. Government agencies, research institutions and consultant companies usually paying more attention in the planning stage and awareness-raising period in the implementation stage, while leading enterprise in the industry will focus more on setting up the framework and standards for implementation, as well as mobilising other investors and players whenever needed. Shanghai, Wuhan and Shenzhen could separately represent different pathways towards multi-agent participations and interactions in this process. Shanghai, supported by its open business environment, sound financial mechanism and strong competitiveness as a World City, has indisputable advantages in terms of introduction and mobilisation ability and capacity to attract the involvement of leaders, experts and entrepreneurs with global visions, jointly committing to outstanding social and economic benefits. Shenzhen, as a representative of China's most innovative city, has been exploring various innovative ways of organisation and institution to form multiple replicable

experience boosting governance flexibility and niche innovation. Wuhan's good practice in the development of the Smart City largely depends on policy makers' attitude, and their aspiration to obtain and even lead the development trends at home and abroad in smart technology applications, which has enabled Wuhan to achieve a first-mover advantage over other cities. The organic combination of "active policy resources, strong ICT industry foundation and high academic capabilities" can also be seen in its government-led multi-agent participation pattern in Wuhan.

The purpose of this measure is to mobilise many actors in a new kind of learning process through participating in the planning process and implementation commitment.

Across six Chinese case studies, one of the identified measures of successful smart city development is that pilot cities have the opportunity for experimentation and testing (domain "Core development processes") and other cities or governmental officers have the chance to exchange know-how and learn from pilots at national level (domain "Relational Dimensions").

This is a common and effective approach in the core development process of smart city promotion in China, in which national government is usually responsible for identifying long-term key issues, while the municipal government in pilot cities will address such issues through trying errors at community level, and then the successful experiences will be upscaled in regional and national approaches through exchanging government officials or study trips among cities. In this approach, the key factor is the high initiative and proactive attitude of the local government, i.e., the high initiatives from district government or even lower- to community-government level. Starting from a smaller scale is always more realistic and feasible in smart city implementation.

The merit of this measure is that, through pilot experiment and testing, the overall social cost of trial and error can be minimised, and upscaling can be run more smoothly via the analogous comparison and exchange field trip studies.

Tianjin, Wuhan and Chongqing case studies also show that higher public awareness and social learning systems are a key measure to increase transformative capacity. These measure increase the commitment towards implementation by actors/community involved (domain "Agency and interaction forms").

Mobilising and utilising all the existing media for raising public awareness is another key factor in reducing the planning and implementation gap in China thanks to its traditional culture legacy and strong government leadership. Once the planning is carried out and the pilot programme is implemented, the municipal government will usually launch a parallel process to raise awareness of the issue, and update the progress by branding and marketing the planning and implementation commitment through all means and media, including local TV programmes, newspaper, internet, and other social media such as WeChat, and short mobile messages. By doing so, the

overall transaction cost in the implementation process can be largely reduced by, for example, smoother relocation in the redevelopment process under the support of local residents. Through the application of new media, a more effective feedback and social learning system is gradually enhanced. It can be observed that all pilot cities in the national smart city programme in China generally have higher public awareness in terms of understanding the development of their own city and the knowledge scope of the smart city itself.

The case study of Tianjin shows that more international cooperation and collaboration in terms of exchange of know-how (domain: “Core development process”) increases the quality of city planning (domain: “Relational dimension”) and leads to more successful pilot city development in China.

Given that the smart city development is still in its pioneer stage worldwide, cities implementing this pilot programme have higher motivation to search for international cooperation and assistance whenever possible. More international projects then can be attracted to the city, which, in turn, becomes the catalyst for stimulating smart city development and improving the implementation process in the city. The Sino-Singapore eco-city in Tianjin provides such evidence in helping the city to enhance its overall quality in city planning and implementation.

The essence of this instrument is that raising public awareness and reaching a consensus for urban development vision is vital for closing the gap between planning and implementation.

Shenzhen demonstrates that room for experiments, innovation and entrepreneurship (domain: “Core development process”) is another important successful factor in closing the gap between planning and implementation in China.

Recognising that the constant change in technologies requires timely adjustment and adaptation for planning and implementation in smart city development, Shenzhen dares to experiment with any new mechanisms in the process. Through fully realizing its advantages in terms of high entrepreneurship and high exposure to international society, which gives the city a good opportunity to integrate international best practice with its local settings, Shenzhen carried out some innovative mechanisms in the smart city development process. For example, Shenzhen took a different approach to digital city development, based on its own exploration, instead of outsourcing an overall player to carry out the project, as in the traditional popular way, Shenzhen divided the project into two subsystems, the user and supplier sides; each side then can concentrate its focus to jointly improve the whole system. This division of labour not only improved the efficiency of the implementation, but also greatly enhanced the quality of the whole system through maximising the expert role on two sides.

Actively exploring new technologies and innovative approaches based on the local setting is always an effective way to implement plans.

5. Reflection and Further Research

Reflections are made in correspondence with the two aims of this book chapter: (1) the application of a framework in the European and Chinese context to better understand transformative capacities, and (2) the illustration of innovative approaches based on case studies for bridging the planning implementation gap. Additionally, further research has been identified, to move from the identification of innovation approaches to actively shaping capacity-building.

The application of framework on transformative capacities of Wolfram (2016) (research aim number 1) to empirically identify activities that build transformative capacities has worked well in China and Europe, despite their differences in the planning processes. The application of the framework delivered innovative approaches and activities that were used in Chinese and European cities to overcome gaps, and which could be considered as measures to build transformative capacities. However, it was not always easy to conduct the case studies due to language problems, the availability of information and the different planning structures and actors responsible. The case studies illustrate innovative approaches and activities to address the planning implementation gaps, but they are less comparable than expected.

Because smart cities are relatively new concepts, European as well as Chinese urban practitioners are experimenting and developing new approaches to improve the alignment between urban planning and implementation. According to aim 2 of this book chapter, the innovative approaches to build transformative capacities that European and Chinese cities have taken should be illustrated. As conceptualised by the framework, transformative capacities have a positive effect on city planning as well as implementation. The case studies reveal that certain transformative capacity building measures and activities are critical across Chinese and European cities, which were addressed by all of them. These are: “Diversity of actors and appropriate resources”, “Leadership and ownership by appropriate key actors” or “Continuity of actors cross multi-level governance/bodies”. This suggests these measures are particularly important when it comes to the building capacity, to effectively close the planning and implementation gap.

Importantly, however, the case studies show that while there are commonalities in the importance of certain transformative-capacity-building measures between Europe and China, the way these capacity measures and activities are expressed differs between Chinese and European cities and always embodies the local context. For example, while the transformative-capacity-building measure of “diversity of actors and appropriate resources” is key in all cases studies, there is a difference in how this diversity plays out and what resources are made available. While European cities show a stronger tendency to organise and substantiate this diversity of actors in more horizontal way, Chinese cities express this diversity from a more

vertically organised governance perspective. A similar observation can be made with the transformative-capacity-building measure of “Leadership and ownership by appropriate key actors”, which was also found to be critical across all cases. In European cities, this capacity measure manifests itself in a more decentralised way, in which leadership and ownership become a more distributed phenomenon in smart city planning and implementation. In Chinese cities, however, leadership and ownership are expressed in a more centralised and consolidated way, while also empowering actors at a lower administrative level.

These two examples also highlight that capacity measures are closely interlinked and shape smart city development in combination. Clearly, a more horizontal expression of the “diversity of actors” in European Cities goes hand in hand with more distributed and decentralised interpretation of “Leadership and ownership” measures in smart city development. Likewise, more vertically organised “diversity of actors” in urban governance will also have direct implications for the centralisation and consolidation of “leadership and ownership” in smart city development processes. Taken together, the Chinese cases highlight that top-down-focused approaches towards smart city planning and the provision of smart city programs is one of the success factors in China. On the contrary, top-down-focused approaches seem to be less likely to be the key factor for success in European cases and, instead, smart city planning and implementation success use more bottom-up-intensive approaches.

The case study analysis also revealed that more transformative-capacity-building measures related to the “Relational Dimensions” were used in European cities than in Chinese cities. One example of this is that European cities have used innovative approaches and processes to facilitate cross-departmental as well as cross-jurisdictional collaboration, even though this comes with higher transaction costs due to the additional coordination efforts. This finding was less pronounced across Chinese cases, which calls for attention to investigating measures that build this transformative capacity dimension in a more vertically and hierarchically organised city planning and implementation context in future analysis. Another example is European cities’ approach to monitoring and evaluation (also part of the “Relational Dimension”). European case studies demonstrate that transparency in monitoring and evaluation is seen as an opportunity to facilitate learning between stakeholders and to allow for flexibility and adaptation in planning and implementation processes. In European cases, monitoring and evaluation were also used to develop best-practice examples and lessons-learned, which were shared with a wider group of stakeholders. Chinese cities, on the other hand, have developed a stronger focus on structured peer-to-peer learning among urban development officials, and on bi-lateral learning and experience-sharing partnerships with dedicated cities outside of China.

However, although the framework has worked well and we learned about innovative approaches and activities for capacity building, the research results only

outline the status quo in the case study cities. Further research is needed to distil more general measures and tools from the innovative activities and approaches, to build the necessary capacities to eventually generate a toolbox for the choice of city. Moreover, in the next step, the active shaping of transformative capacity would be to the benefit of cities. Loeber (2007) and (Cramer and Loeber 2004) outlined the transformative learning approach. This approach focuses on the development of dedicated and specific participatory and collaborative dialogues in cities, including a reflection process that leads to the production of transformative knowledge, commitment to implementation and, finally, transformative learning. This approach could be used to better address and refine the innovative approaches in a participatory way.

Author Contributions: Individual contributions of authors were as follows: overall conceptualisation, review and editing Susanne Meyer; literature review Gudrun Haindlmeier, Hans-Martin Neumann, Daiva Jakutyte-Walangitang; methodology—framework for capacity building Gudrun Haindlmaier, Susanne Meyer; methodology—case study approach Daiva Jakutyte-Walangitang, Susanne Meyer, Jianming Cai; empirical case study analysis—Europe Gudrun Haindlmaier, Christoph Brodnik, Daiva Jakutyte-Walangitang, Hans-Martin Neumann; empirical case study analysis—China Jianming Cai, Yan Han and Jing Lin; reflections and further research Christoph Brodnik, Susanne Meyer, Jianming Cai.

Funding: This research was funded by the European Union’s Horizon 2020 research and innovation programme, grant number 770141.

Conflicts of Interest: The authors declare no conflict of interest

Appendix A. Map of European Cities Active in Smart City Programmes

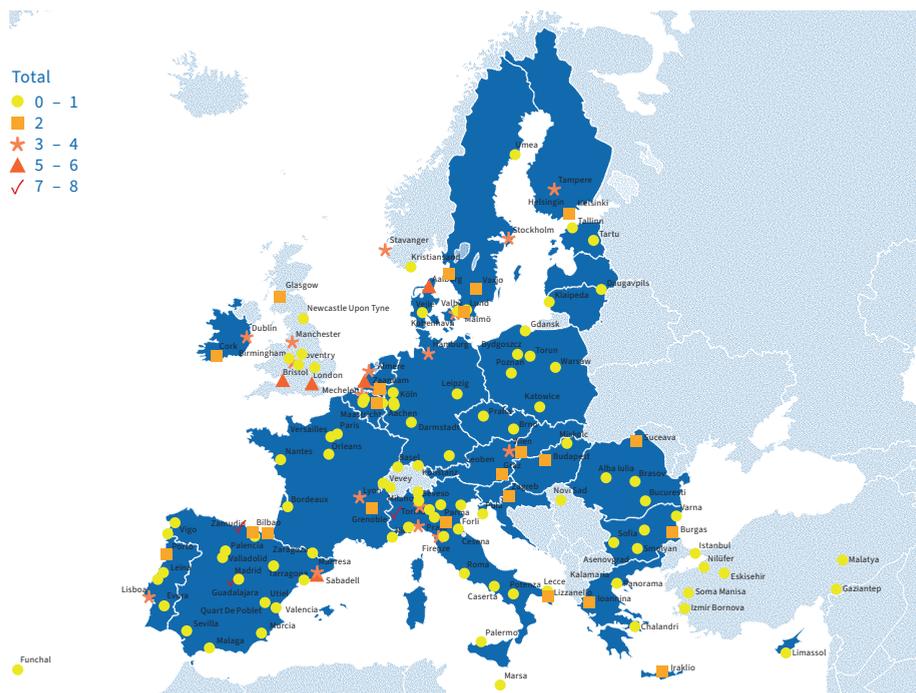


Figure A1. European cities that are involved in Smart City projects (legend shows the number of projects cities are engaged). Source: Figure by authors.

Appendix B. Detailed Overview of Smart City Programmes in China

The following approaches and practices of pilot programmes that have been launched by Chinese government ministries or agencies are used for identifying cities that are more active in Smart City development:

- In May 2012, the Ministry of Housing and Urban-Rural Development of the PRC (MOHURD), one of the leading stakeholders in city construction and management in China, officially issued a “Notice on Carrying Out the National Smart City Pilot Programme”: each city with application intentions is required to formulate a specialised plan, coupling with national objectives and local conditions, which shall be submitted to the MOHURD after the approval of the corresponding provincial government. From 2012 to 2015, MOHURD announced three batches of National Smart City Pilots (NSCP) with a total of 277 programmes covering 179 prefecture-level or county-level cities distributed in 23 provinces, five national autonomous regions and four provincial-level municipalities;

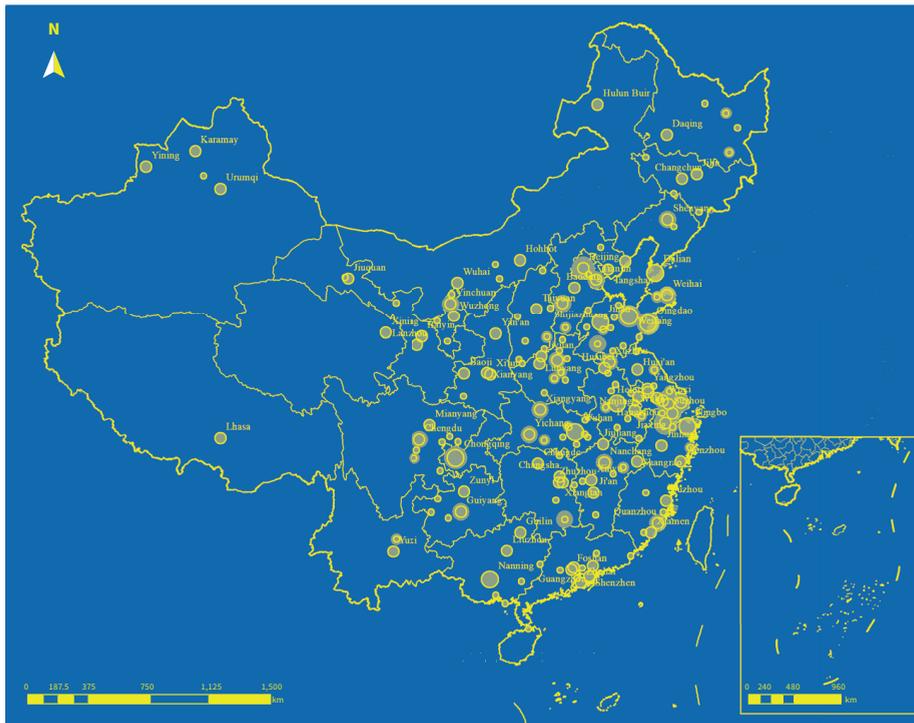
- In Dec 2012, the National Administration of Surveying, Mapping and Geo-information (NASMG), the most important public technology supporter in China for Smart City development, announced the launch of a pilot programme constructing Smart City's Cloud Platform for Spatio-Temporal Information (CPSI), which mainly focuses on the construction of spatial information infrastructures. By collecting and analysing real-time spatio-temporal information, this is supposed to make great contributions to achieving more intelligent decision-making for urban development, more flexible public services for citizens, and more transparent and reliable pathways towards sustainability. Since 2013, about 10 cities were selected by NASMG for piloting each year, and the construction period for each pilot city is about 2 to 3 years. By 2018, up to 46 cities were listed as pilot cities;
- In Dec 2013, the National Information Consumption City (NIC) Pilot Programme was launched by the Ministry of Industry and Information Technology of PRC (MIIT), the most important administration agency in supervision and managing smart technology development and application in China. The essential criteria for pilot selection include that the city should have solid foundations in the economic performance and information infrastructure, i.e., the city should not only be advantageous for providing information services and products for citizens, but should also have excellent practices in the operation pattern, the innovation encouragement, public service function and governance capacity. By 2018, a total of 104 pilot cities (also including counties and districts) were promulgated, including more than five pilot cities in each of these provinces, including Jiangsu, Shandong, Anhui, Guangdong, Hebei, Jilin, Sichuan and Zhejiang. By the end of 2015, 25 demonstration cities with best practices were selected through the process of application by municipalities, pre-evaluation by provincial governments and final evaluation by national expert commission;
- The Technology and Standard Pilot Programme for Smart City (TSPPSC) Construction was jointly issued by the Ministry of Science and Technology of the PRC (MOST) and the Standardization Administration of China (SAC) in 2012 to carry out pilot demonstration work in 20 cities across the country. This programme aims to provide a network platform for local governments and national science and technology programmes involving Cloud Computing, Big Data, and the Internet of Things to form a general scheme for smart city development by promoting technological and economic cooperation. Each pilot city is asked to, respectively, formulate a concrete implementation plan for three years. By the end of the implementation, their performances and achievements will be critically and thoroughly evaluated to draw the replicable experiences. The replicable experiences from each city will then be further summarised and

standardised to contribute to China's technology and standard system of smart city construction;

- In 2014, 12 national ministries or bureaus (D12) jointly approved a list of 80 cities for pilots of People-Beneficial-Oriented National Information Cities (NIPC). The main objectives of this pilot programme are to improve the capabilities of/access to public services, optimise public resource allocation, and promote the sharing of knowledge, innovation, infrastructure and business networks among actors such as municipal government agencies, communities, enterprises and grassroots institutions. A spectrum of experts recommended by different ministries was jointly established to provide advice on construction and governance innovation in these pilot cities. Additionally, this programme takes communities or neighbourhoods as the basic spatial units to collect and integrate real-time data or information to avoid both extremes: unreasonably oversized information systems or the possibly emerging of "information isolated islands". The services involved in the information system cover many aspects and topics, including urban construction, social security, health care, pension, education, industry, employment and community services.

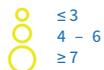
Appendix C. Map of Chinese Cities Participating in Smart City Programmes

Smart City & Eco City Pilots (Intersection)



Legend

No. of Pilot Types



No. of Pilot

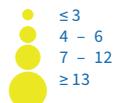


Figure A2. Chinese pilot cities by number of pilot projects and number of types of pilot programmes. Source: Figure by authors.

References

- Braithwaite, Jeffrey, Kate Churrua, Jenet C. Long, Louise A. Ellis, and Jessica Herkes. 2018. When Complexity Science Meets Implementation Science: A Theoretical and Empirical Analysis of Systems Change. *BMC Medicine* 16: 1–14. [CrossRef] [PubMed]
- Brodnik, Christoph, and Rebekah Brown. 2018. Strategies for developing transformative capacity in urban water management sectors: The case of Melbourne, Australia. *Technological Forecasting and Social Change* 137: 147–59. [CrossRef]

- Chen, Yanxin. 2020. Research on the Market Embeddedness and Co-construction Mechanism of Stakeholders about Smart Water—A Case Study of Zhejiang Province. MA thesis, Hangzhou Dianzi University, Hangzhou, China.
- Cramer, Jacqueline, and Anne Loeber. 2004. Governance Through Learning: Making Corporate Social Responsibility in Dutch Industry Effective from a Sustainable Development Perspective. *Journal of Environmental Policy & Planning* 6: 1–17.
- European Commission. 2015. A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy COM/2015/080. Available online: https://eur-lex.europa.eu/resource.html?uri=cellar:1bd46c90-bdd4-11e4-bbe1-01aa75ed71a1.0001.03/DOC_1&format=PDF (accessed on 17 July 2020).
- European Commission. 2016. Pact of Amsterdam. Available online: https://ec.europa.eu/futurium/en/system/files/ged/pact-of-amsterdam_en.pdf (accessed on 17 July 2020).
- European Commission, and UN Habitat. 2016. *The State of European Cities. Cities Leading the Way to a Better Future*. Brussels: Publications Office of the European Union.
- European Innovation Partnership on Smart Cities and Communities. 2013. *Strategic Implementation Plan*. Brussels: European Innovation Partnership on Smart Cities and Communities.
- Frantzeskaki, Niki, Vanesa Castan Broto, Lars Coenen, and Derk Lorrbach, eds. 2019. *Urban Sustainability Transitions*. Routledge Studies in sustainability transitions. New York: Routledge.
- Gaiddon, Bruno, Julia Girardi, Hans-Martin Neumann, Korinna Thielen, Etienne Vignali, and Willi Wendt. 2016. Three cities—Lyon, Munich, Vienna—Will be SMARTER TOGETHER. In *REAL CORP 2016 Proceedings/Tagungsband*. Edited by Manfred Schrenk, Vasily V. Popovich, Peter Zeile, Pietro Elisiei and Beyer Clemens. Vienna: CORP.
- Geels, Frank W. 2010. Ontologies, socio-technical transitions (to sustainability), and the multi-level perspective. *Research Policy* 39: 495–510. [CrossRef]
- Gunn, Lewis A. 1978. Why is implantation so difficult? *Management Services in Government* 33: 169–76.
- Healey, Patsy. 2007. Urban Complexity and Spatial Strategies: Towards a Relational Planning for Our Times. *Patsy Healey*. [CrossRef]
- Hill, Michael, and Peter Hupe. 2015. *Implementing Public Policy*, 3rd ed. London: Sage.
- Huang, Fengjue, Yang Tao, and Zhang Yecheng. 2020. Hotspots and Trends in Smart Cities Researches (2010—2019)—Quantitative Analysis of Graphs Based on CiteSpace. *Urban Planning Journal* 2: 56–63.
- Hudson, Bob, David Hunter, and Stephen Peckham. 2019. Policy failure and the policy-implementation gap: Can policy support programs help? *Policy Design and Practice* 2: 1–14. [CrossRef]
- Huovila, Aapo, Miimu Airaksinen, Isabel Pinto-Seppä, Peter Bosch, Topi Penttinen, Hans-Martin Neumann, and Nikolaos Kontinakis. 2017. CITYkeys smart city performance measurement system. *International Journal for Housing Science and Its Applications* 41: 113–25.

- Innes, Judith, and David Booher. 2018. London: Routledge. In *Planning with Complexity: An Introduction to Collaborative Rationality for Public Policy*, 2nd ed. London: Routledge. [CrossRef]
- Kunze, Antje, Jan Halatsch, Carlos Vanegas, Martina Jacobi Maldaner, Benamy Turkienicz, and Gerhard Schmitt. 2011. A Conceptual Participatory Design Framework for Urban Planning. Paper presented at the 29th eCAADe Respecting Fragile Places, Ljubljana, Slovenia, September 21–24.
- Li, Deren. 2012. The concept, supporting technology and application of smart city. In *Engineering Research: Engineering from an Interdisciplinary Perspective*. Beijing: Beijing Institute of Technology Press, pp. 313–23.
- Lipsky, Michael. 1980. *Street-Level Bureaucracy*. New York: Russell Sage Foundation.
- Loeber, Anne. 2007. Designing for Phronèsis: Experiences with Transformative Learning on Sustainable Development. *Critical Policy Analysis* 1: 389–414.
- Loorbach, Derk, Julia M. Wittmayer, Hideaki Shiroyama, and Junichi Fujino, eds. 2016. *Governance of Urban Sustainability Transitions. European and Asian Experiences*. Heidelberg: Springer.
- National Development, and Reform Commission. 2013. *The Decision on Major Issues Concerning Comprehensively Deepening Reforms*. Available online: http://www.gov.cn/zwggk/2013-05/24/content_2410444.htm (accessed on 20 August 2020).
- Neumann, Hans-Martin, Jakutyte-Walangitang Daiva, Vielguth Stefan, Züger Johann, Airaksinen Miimu, Huovila Aapo, Bosch Peter, Vera Rovers, Jongeneel Sophie, and Pangerl Eva. 2015. *Overview of the Current State of the Art*. Deliverable 1.2. Available online: www.citykeys-project.eu (accessed on 7 January 2021).
- Neumann, Hans-Martin, Jakutyte-Walangitang Daiva, Meyer Susanne, Haindlmaier Gudrun, Brodnik Christoph, Jianming Cai, Yan Han, Jing Lin, Empu Ma, and Wei Han. 2018. *Concept for Practical Tools and Mechanisms for the Development of Sustainable Cities, Integrative Planning and Implementation*. Deliverable 2.2. Available online: <http://transurbaneuchina.eu/results/> (accessed on 11 August 2020).
- Neumann, Hans-Martin, Jianming Cai, Susanne Meyer, Daiva Jakutyte-Walangitang, Gudrun Haindlmaier, Yan Han, Wei Han, Jing Lin, and Empu Ma. 2019. *Knowledge Base on the Transformative Capacity of Smart Cities and Eco Cities in China and Europe to Close the Planning Implementation Gap: Innovation, Good Practice and Success Factors*. Deliverable 2.1. Available online: <http://transurbaneuchina.eu/results/> (accessed on 11 August 2020).
- Pressman, Jeffrey L., and Aaron B. Wildavsky. 1973. *Implementation: How Great Expectations in Washington Are Dashed in Oakland: Or, Why It's Amazing That Federal Programs Work at All, This Being a Saga of the Economic Development Administration as Told by Two Sympathetic Observers Who Seek to Build Morals on a Foundation of Ruined Hopes*. Berkeley: University of California Press.
- Rittel, Horst W. J., and Melvin M. Webber. 1973. Dilemmas in a General Theory of Planning. *Policy Sciences* 4: 155–69. [CrossRef]
- Shen, Minghuan. 2010. “Smart City” facilitates the transformation of China’s urban development model. *Urban Observation* 4: 140–46.

- Sun, Zhongya. 2013. A Review of Smart City Research and Planning Practice. *Urban Planners* 29: 32–36.
- Walker, Brian, Stanley Holling Crawford, Stephen Carpenter, and Ann Kinzig. 2004. Resilience, Adaptability and Transformability in Social–ecological Systems. *Ecology and Society* 9: 5. [CrossRef]
- Wilson, Samuel, Leonie J. Pearson, Yoshihisa Kashima, Dean Lusher, and Craig Pearson. 2013. Separating Adaptive Maintenance (Resilience) and Transformative Capacity of Social-Ecological Systems. *Ecology and Society* 18: 22. [CrossRef]
- Wolfram, Marc. 2016. Conceptualizing urban transformative capacity: A framework for research. *Cities* 51: 121–30. [CrossRef]
- Wolfram, Marc, and Niki Frantzeskaki. 2016. Cities and Systemic Change for Sustainability: Prevailing Epistemologies and an Emerg-ing Research Agenda. *Sustainability* 8: 144. [CrossRef]
- Wolfram, Marc, Sara Borgström, and Magan Farrelly. 2019. Urban transformative capacity: From concept to practice. *Ambio* 48: 437–48. [CrossRef]
- World City Ranking. 2020. *The World According to GaWC 2020*. Available online: <http://www.lboro.ac.uk/gawc/world2020t.html> (accessed on 7 January 2021).
- Wu, Qi. 2013. Comparison of smart cities at home and abroad. *Finance and Economics* 19: 30–31.
- Xie, Yao, Junmin Zhang, and Jianshu Shan. 2015. Research Summary of Master Urban Plan Implementation Evaluation of Recent Five Years in China. *City Mater Planning* 6: 21–26.
- Xu, Lijun, and Jinghai Zhu. 2020. Reflection on the Resilience of National Land Use and Spatial Governance in the Face of Emergency Public Health Event. *Planners* 36: 49–51, 66.
- Zhen, Feng, and Qin Xiao. 2014. The application of big data in smart city research and planning. *International Urban Planning* 29: 44–50.
- Zheng, Yongnian. 2007. *Technological Empowerment: The Internet, State, and Society in China*. Stanford: Stanford University Press.
- Ziervogel, Gina, Anna Cowen, and John Ziniades. 2016. Moving from Adaptive to Transformative Capacity: Building Foundations for Inclusive, Thriving, and Regenerative Urban Settlements. *Sustainability* 8. [CrossRef]

© 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Social Cost–Benefit Analysis—Supporting Urban Planning and Governance for Enhancing Social Integration

Andrea Ricci, Riccardo Enei and Enpu Ma

1. Introduction

This article addresses the following question: how can social cost–benefit analysis (SCBA) methodologies and techniques support the transition towards socially integrative cities in the EU and China? As outlined in TRANS-URBAN EU-CHINA (2018), a city is socially integrative when it meets a variety of requirements, notably including an efficient and affordable transport system that ensures smooth mobility and significant reduction of congestion episodes. An easily accessible and performant transport system is in fact a fundamental prerequisite of social integration, as it provides the basic infrastructure for citizens to reach and interact with one another, whether for work, family-related or leisure needs. Furthermore, in a socially integrative city the quality of life and urban environment are conducive to citizens increasing wellness, reducing air pollution, accidents and noise nuisance. Many of the benefits enjoyed by socially integrative cities are not directly amenable to monetary valuation, and as a result they are usually excluded from traditional CBA, leading to distortions and suboptimal—if not outright wrong—decisions. To provide a more reliable basis for policy and decision making, SCBA is designed to incorporate the monetary valuation of the widest possible range of externalities (environmental, social and economic). Externalities may be defined as those costs (and benefits) that are not (exclusively) borne (enjoyed) by those who generate them, leading to inequalities and unfair playing fields. Policy and decisions that incorporate externality valuation (i.e., SCBA) allow us to reduce inequalities and increase fairness, which are inherent features of a socially integrative city.

This article firstly provides a comparative EU/China assessment of the state-of-the-art knowledge in the field of social cost–benefit analysis (SCBA) applied to the evaluation of urbanisation activities, i.e., urban expansion and renewal, shedding light on analytical tools and instruments that serve the endeavours towards better socially integrative cities in China and EU. The state-of-the-art assessment is based on an extensive literature review from academia, national agencies for environment and spatial planning and research institutes, in addition to case studies from Chinese urban areas. It notably includes the relevant set of indicators and evaluation methods commonly adopted in the Organisation for Economic Cooperation and Development

(OECD) area along with examples of case studies dealing with negative externalities in China.

Building on the above, the article then highlights possible approaches, tools and techniques that can support the transition towards socially integrative cities in China. It concludes that the application of SCBA in urban planning and management offers great potential to support urban planners and local administrators in improving urban environment and quality of life. More importantly, the contribution of the EU knowledge base, when conveyed through guidelines and analytical tools, may be of interest to Chinese stakeholders, providing quantitative evidence for policy making in the field of urban planning and governance.

2. Material and Methods for the Application of SCBA in Urban Planning and Governance in Europe

In Europe, as well as in the US and more in general in the countries of the OECD area, the application of social cost-benefit analysis (SCBA) to urbanisation activities requires the analysis of a series of interlinked and complex areas of research, ranging from the evaluation of social externalities arising from transportation activities to the impacts of urbanisation such as, e.g., land take, and addressing domains like quality of life, public health, well-being, loss of amenities and eco-system services. The analysis of these impact dimensions allows us to understand how they relate to the objective of building socially integrative cities.

For example, externalities caused by the interaction between transportation activities and the environment, human capital and other non-renewable resources represent a key factor that affects living conditions in urban areas. The application of SCBA in the assessment of the social costs of accidents, noise and air pollution emissions, congestion and greenhouse effects can provide a direct contribution to the design of sustainable transport policies, mitigating their undesired side-effects through a better knowledge of their order of magnitude, which allows to better understand their social and technical determinants and causal factors, e.g., types of pollutant vehicles.

The proposed classification has no pretence of being exhaustive; it broadly reflects the key components in which the SCBA techniques have been applied. It features five broad categories:

1. externalities from transportation activities (accidents, noise, air pollution, congestion and climate change);
2. externalities from built environment (urban sprawl, change in the provision of amenities and green areas, etc.);
3. loss of ecosystem services and biodiversity;
4. economic externalities from the management of public services and infrastructure;
5. impacts on quality of life, health and cultural values.

For each category, the next sections show the key insights that emerged from the literature review, which can orient the building of more socially integrative cities, including caveats on data availability and data interpretation.

2.1. Externalities from Transport Activities

This area of SCBA deals with a broad range of transport externalities originated by urbanisation activities, specifically those arising from the use of transport infrastructure. Transport externalities, which include air pollution, accidents, noise emissions, climate change and congestion, are in some cases examined and quantified in the form of handbooks, which present possible methods of calculation, reference values and evaluation guidelines.

These sources provide the knowledge base for setting up tools for the internalisation of external costs arising from urbanisation as well as reference values that can be transferred to different contexts when context-specific information is not available, i.e., the so-called “benefit-transfer method” (NEEDS 2009).

Milestones in this field of research are the European handbooks on the evaluation of external costs of transport (Ricardo-AEA 2014; CE Delft 2019). The handbooks show calculation methods and methodological assumptions behind the assessment of the key external costs categories: air pollution, climate change, accident, noise and congestion, providing a useful guideline for policy makers and researchers. In Europe, in 2016, the order of magnitude of the key external costs is about EUR 900 billion, corresponding roughly to about 6% of EU GDP.

In general, the main methodological approaches used to evaluate social factors that cannot be measured through market prices—e.g., effects on the environment and health, landscape, nature and spatial quality—include: (a) damage cost approaches, (b) avoidance cost approaches and (c) replacement cost approaches.

The damage cost approach evaluates the damage generated by a given externality (e.g., a gram of pollutant emitted by a vehicle) considering the entire impact pathway from the cause to the final effect on human beings and the environment. Unit damage costs, i.e., the social costs that one gram of pollutant imposes on, e.g., human health, are multiplied by the causal factors (total emissions by type of vehicle) to provide the monetary valuation of the externality. Health impacts often account for a large share of the overall social costs, and damage cost values then rely on epidemiological studies, which allow us to estimate the damage to human life in terms of reduction of life expectancy and morbidity. If damage costs are not available from literature or field studies, proxy values may be derived through contingent valuation studies (stated preference surveys) that investigate people’s willingness to pay for avoiding the damage (WTP) or to accept the damage (WTA).

The avoidance cost approach, on the other hand, can be adopted to derive cost values when the full w impact pathway cannot be documented due to lack of

evidence. In such cases, a proxy of the damage cost is taken to be the cost necessary to avoid the damage itself, as for example taxes paid to reach environmental targets for damages of transport CO₂ emissions to ecosystems.

Finally, the replacement cost approach, applied in general to transport infrastructure, estimates the external costs based on the costs necessary to replace the asset damaged by the infrastructure, e.g., land damaged by the construction of an airport.

All these methodologies directly support the formulation of urban development policies that (i) help reduce negative externalities, therefore improving the environment and living conditions in urban areas and (ii) foster the internalisation of externalities, therefore increasing fairness in accordance with the “user pays” principle. Ultimately, they thus contribute directly to the attainment of socially integrative cities, by, e.g., relieving congestion and improving accessibility to urban services and functions.

2.2. Externalities from the Built Environment

Built environment, e.g., the design of cities, their compactness and distribution of working places and amenities, exerts multi-faced impacts which may trigger externalities. Air pollution and CO₂ emissions, for example, are side-effects of urban sprawl and urbanisation activities (e.g., urban expansion, land take, infrastructure provision). In the USA, a meta-analysis from 100 metropolitan regions showed that compact development cities could reduce U.S. transportation CO₂ emissions by 7–10%. A study of 45 metro regions also showed that the least compact regions had 60% more high ozone days than most compact regions (Kramer 2013).

In some cases, built environment as resulting from urbanisation can also affect water pollution (Ando and Netusil 2013). For example, a proper design of infrastructure for stormwater management (e.g., sewage, low-impact or green infrastructure, etc.) can reduce water pollution, turning investment costs in benefits.

When it comes to externality valuation, evidence is often made available from contingent valuation surveys that investigate the willingness to pay of citizens to, e.g., live in urban areas as green areas, urban forest, parks, etc. (Latinopoulos et al. 2016).

However, in a cross-comparison perspective, the outcomes from contingent valuation surveys must be validated in the local context, since contingent valuation outcomes are in general strongly dependent on local conditions and therefore transferability in other contexts may be problematic.

The valuation of externalities arising from the built environment, e.g., urban sprawl, would ultimately lead to a more efficient use of land, e.g., raising its price and compensations to farmers. The increased values of land could limit conversion from “rural” to “urban”, reducing urban sprawl and improving the quality of life in urban areas.

2.3. Ecosystem Services and Biodiversity

The literature on the assessment of impacts on human well-being from land degradation and loss of biodiversity—a side effect of urbanisation activities—has been flourishing over the past years. It is acknowledged that “this imbalance in information likely contributes to the distortion in land-use policies, giving preference to maximizing provisioning services in agricultural production and forestry, while neglecting the societal relevance of regulating and cultural services.” (Förster et al. 2019).

These contributions are relevant insofar as they can provide reference values (monetary values) for social and cultural services, e.g., recreation, for which the quantification in monetary terms is complex, uncertain and generally lacking.

However, the insights from literature point to a series of caveats against the use of monetary evaluations in contexts different from the original case study, without proper specifications and adaptations.

The monetary evaluation of ecosystem services and biodiversity is indeed highly site specific, depending on cultural and socio-economic conditions related to the context. The conclusion is that the direct transferability to a different context must be carried out with caution, avoiding direct transposition and generalisations.

Considering the limitations and drawbacks in the use of monetary valuations, decision makers and urban planners can however use the insights from literature review as a starting point, integrating them with site-specific variables.

Against this backdrop, a possible approach is the adoption of multi-criteria decision analysis (MCDA), combining quantitative and qualitative information concerning biodiversity and ecosystems, and taking into account the views and values of multiple stakeholders, as “preferences, needs or demands expressed by people towards nature” (Pandeya et al. 2016).

In conclusion, an adequate monetary valuation of eco-systems entails the use of different and heterogenous techniques.

Despite the complexity of this study area, the application of SCBA methodologies and tools to the valuation of eco-systems can directly contribute to the formulation of policies and measures that contain land degradation and the loss of biodiversity, thus improving the quality of life of urban environment, one of the pillars of socially integrative cities.

2.4. Economic Externalities from the Management of Public Services and Infrastructure

Specific forms of urbanisation, i.e., urban sprawl, are known to generate economic externalities affecting the performance of urban public services and infrastructure, in the form of higher management costs not paid by all city users.

In the United States (Ford 2010) two case studies carried out for the EPA (Environmental Protection Agency) compared CSD (Conventional Suburban

Development, characterised by the typical sprawled suburban models) and TND Traditional Neighbourhood Development (Smart Growth “compact” Development Model) infrastructure costs. The results showed an average reduction of management of public services and infrastructure costs by 32–47% in more “compact” cities.

Along the same research pathway, Litman (2015), with reference to a panel of OECD countries, estimated the impacts of urban sprawl on public infrastructure management and services cost-efficiency. As for the US study, evidence suggested a more efficient public service management in less sprawled cities. For example, the adoption of more compact cities in US “would reduce annual public service costs about 10% and housing costs about 8%, saving on average \$13,000 per dwelling unit, or 7.8% of total development costs” (Burchell et al. 2002).

In general, the insights of these contributions are important, for they address the issue of how agglomeration economies can capture the benefits/costs arising from proximity between households and firms.

The methodology for the assessment of social costs entails the development of engineering approaches that compare cost variability with structural urban variables such as lengths, density, etc. The resulting estimation of the variability of infrastructure quantities and costs according to different urban forms is compiled for different urban development scenarios. The statistical analysis of correlations between the incremental costs of public services and sprawled urban development may also be used for deriving elasticities.

Urban forms affect the provision (in quality and quantity) of public services; a case in point are those services for which density represents an important factor influencing service costs and performances (e.g., waste management). SCBA applied to the analysis of the performance of public services in different urban areas then provides an indirect contribution to improving accessibility, assuring equal access to municipal services, another pillar of socially integrative cities.

2.5. Quality of Life, Health and Cultural Values

The focus is on the relationships between quality of life/well-being and urban forms. Available studies rely on statistical analysis of samples of cities at worldwide level (with a particular focus on EU cities), aiming at the identification of factors that can explain the insurgency of distress and social inequalities in large cities (Nabielek et al. 2016).

Along this line of research, contributions investigating the relationships between population health and land use policies are particularly relevant.

These studies mostly rely on modelling exercises to estimate how urban design interventions, e.g., planning a compact city, can reduce transport activities and promote healthier lifestyles. Examples of this literature are mainly related to European urban areas (Stevenson 2016).

The relevance of these contributions to the attainment of socially integrative cities is mainly methodological, i.e., providing models that correlate urbanisation forms with drivers that may influence social well-being and more in general quality of life. However, the quantification of these impacts suffers of a limited potential in terms of the generalisation of results from one context to another.

3. Material and Methods for the Application of SCBA in Urban Planning and Governance in China

In China, concerns are growing about the negative externalities that represent the side-effects of recent decades characterised by rising economic development and intensive urbanisation. “The social costs associated with the country’s rapid transformation—the costs of increasing inefficiency, social division, and unsustainable resource use” are well acknowledged (World Bank, and The Development Research Center of the State Council, P. R. China 2014).

Urban areas are deemed to play a fundamental role in whatever strategy will be designed to tackle externalities. With more than 700 million people, urban areas are expected in the next two decades to accommodate 250 million additional migrants from rural areas.

Some of the externalities caused by the recent urban and social developments are emerging as relevant priorities for policymakers and urban planners, stressing the need to move forward towards socially integrative cities in China. As underlined in the New Urbanisation Plan (CCCC 2014), it is time to move from the *urbanisation of land* to the *urbanisation of people*.

3.1. Tourism Growth and Overloading of Public Services

Tourism development is taking new forms in China’s aging society. As population gets older, the volume and patterns of tourism activities are changing. For example, the Hainan Province—an international tourist island with favourable climate conditions—attracts about 450,000 elderly people to spend the winter every year, which creates opportunities for local tourist-driven economic growth (Liu et al. 2018). However, such an increasing seasonal migration also exerts enormous pressure on local municipalities and public services, generating negative externalities: the city’s public transport operates in seasonal overload, the household garbage disposal system is overwhelmed, medical services are in short supply, and public space is more crowded. Altogether, the welfare of local people is negatively affected, while the corresponding social costs are not (fully) borne by seasonal tourists.

3.2. Outdoor Sports Development and Ecological Environment Damage

In recent years, China's outdoor sports and recreation industry has been developing rapidly. Although it has positively contributed to the economic transformation, this largely unregulated development has also generated negative externalities. In particular, green areas are taken for granted as a common national resource, but they can be easily damaged by excessive and unregulated outdoor activities. Damages include the compaction of soil, accelerated soil erosion, vegetation destruction (trampling and breaking), invasion of alien species, habitat loss or transfer, change of animal behaviour, water damage, etc. In the development of outdoor sports and recreation industry, neither enterprises nor tourists are paying for these negative effects.

3.3. Waste Incineration and Increased Environmental and Health Risks

With the rapid growth of municipal solid waste, incineration (as an alternative to landfills) has become an effective treatment option. However, as a typical NIMBY (Not In My Backyard) effect, the operation of waste incinerators significantly increases environmental and health risks in the surrounding areas. In China, due to the lack of public participation in the planning process and the lack of foresight in the planning itself, the pre-location of NIMBY facilities soon became part of the urban expansion area, which brought serious negative impacts to the surrounding residents. These serious effects include the generation of toxic gases such as dioxin, harm to the health of residents, property devaluation, and the generation of fear and disgust, etc. Though incinerators result in a city-wide benefit, social costs are borne primarily by those who live in their proximity.

3.4. Traffic Congestion and Pollution

The biggest urban areas (e.g., Beijing) have been facing significant traffic problems due to the rapid growth of private cars and the comparatively low density of the city's road network. However, despite the overwhelming evidence, only a very limited number of case studies that measure the key externalities are available, e.g., traffic accident, noise pollution, air pollution, greenhouse effect and traffic congestion. In an attempt to fill such knowledge gaps, selected contributions (Zong and Li 2014) quantified negative road externalities according to the calculation method of Di Jing and Wu Wei, by using relevant parameters from the European knowledge base (the German Institute of Transport Policy and Swiss INFRAS Research Institute). Among other striking results, it is found that the externality value of road traffic in Beijing is equivalent to 4.17% of its GDP. The Chinese approaches to the evaluation of transport externalities have shown that there is a potential room for cross-fertilisation with EU methodologies, moving together towards socially integrative cities.

3.5. The Chinese Approach to the Application of SCBA

The prevailing Chinese approach in dealing with externalities, and, consequently, with SCBA, is to focus on the design of appropriate governance strategies. Externalities arising from rapid urbanisation are deemed to be the result of shortcomings in planning and, accordingly, the need of better governance is advocated as the first priority.

Concerning externalities that affect quality of life and environmental protection in urban areas, with the exception of limited examples in the transport sector (see above, Zong and Li 2014), the Chinese methodology of evaluation is mainly characterised by a pronounced focus on policy prescriptions rather than quantification of impacts, such as the provision of handbooks and guidelines.

In other fields of application, for example (Jin 2008), which deals with land management issues, describes the mechanisms of negative externalities from the perspective of property rights, and supports a mixed property rights mechanism that facilitates the internalisation of external costs.

With reference to the externalities arising from the management of public services and infrastructure provision as a consequence of different patterns of urbanisation, e.g., compact vs. sprawled cities, the focus in China is on overcoming the side-effects of massive rural–urban migration, encouraging migration to small and medium cities.

The same approach is found with reference to the externalities affecting social well-being and quality of life. They are generally addressed in the light of the negative impacts from urbanisation processes involving migrant workers. For example, Houkai (2011) points at negative externalities of China’s urbanisation such as the idle farmland in development zones, the reduction of social equity, urban poverty, and the rights and interests of migrant workers. Other contributions (Mingfei 2012) focus on the negative externalities of the current policy of village relocation, for it leads to the increase of construction costs, the extension of the construction period, the loss of rural farmers’ land and jobs, and the shortage of affordable housing.

In such a context, a cooperative adjustment of land is proposed as an innovative way forward. Such policy-oriented methods are usually accompanied by proposals of ways and means to introduce the necessary changes in the approaches established during the past urbanisation processes, suggesting strategic priorities and new agendas for policymakers and planners.

4. Results: Possible Tools and Techniques Supporting the Transition to Socially Integrative Cities in China

Based on the review presented in Sections 2 and 3, Table 1 provides a comparative summary of methods and tools commonly adopted in OECD countries and in China to deal with SCBA topics applied to urbanisation activities.

Table 1. Summary of social cost–benefit analysis (SCBA) methods and tools in Europe and China. Source: Authors’ own elaboration.

Topics	Methods and Tools for SCBA Application in Urbanisation Activities	
	EU/OECD Countries	China
1. Externalities from transportation activities (accidents, noise, air pollution, etc.)	Handbooks and manuals for the calculation of external costs from transportation activities. Unitary values (e.g., EUR/vehicle kilometre) are provided by main cost categories. Key methods: damage cost approaches, b) avoidance cost approaches and c) replacement cost approaches.	Main focus on the design of urban mobility strategies (sustainable urban mobility strategies) to address and reduce negative externalities. Lack of quantitative assessment of external costs.
2. Air pollution and built environment	Contingent valuations, e.g., willingness to pay for greener built environment. Statistical correlations between urban forms and emissions.	Urban growth management strategies designed to curb urban sprawl. Reforms of land prices and compensation, local government autonomy and fiscal responsibility are advocated.
3. Ecosystem services and biodiversity loss	Meta-analysis of monetary valuations of ecosystem services and biodiversity losses. Multi-criteria decision analysis and non-market valuation methods.	Impacts on rural land (idle farmland, loss of arable land) of urbanisation processes. Reforms of land management and administrations, e.g., concession rights, as strategies to overcome rural land degradation.
4. Management of public services and infrastructure	Statistical analysis, e.g., elasticities, and engineering approaches applied to infrastructure and public service provision costs under different urban forms (e.g., urban sprawl).	Estimations of infrastructure costs and revenues of urbanisation patterns. New strategies, e.g., “village urbanisation” advocated to tackle urban sprawl.
5. Quality of life, health and cultural values	Statistical correlations between quality of life, including public health, and urban forms.	Strategies to improve quality of life of migrant workers and farmers as a consequence of past urbanisation patterns.

From a comparative perspective, looking at the potential of cross-fertilisation of SCBA in Europe and China, the promising contributions to the application of SCBA in urban planning are likely to come—first and foremost—from the methodologies developed in OECD countries, whose adoption entails the set-up of calculation tools and guidelines. In such cases, methodologies, indicators and quantifiable impacts are amenable to be used from one context to another, e.g., from European to Chinese cities, although with the necessary caveats. In particular, forthcoming research should take stock of the “benefit transfer” techniques, e.g., transfer units (monetary values) and procedures, as a potentially powerful tool for transferring knowledge. Benefit transfer techniques are of the essence when considering the wide range of variation in unitary external costs. For example, in transportation, the unitary external costs (excluding congestion) from the use of cars in EU range between EUR cent /pkm 12.8 in Austria and EUR cent/pkm 5.4 in Slovenia (CE Delft 2019).

5. Discussion: SCBA in Perspective

In a decreasing order of potential contribution to the generalisation and mutual understanding of results between EU and China, three different approaches can be identified:

1. Methodologies and guidelines for the evaluation of externalities from transportation activities: This research stream produces handbooks, which provide a fully-fledged tool (from methodology to practical guidance towards generalisation) for practitioners, experts, academic and policy makers that seek out methodologies, procedures and reference values to adequately address externalities from transportation activities. The scope of the key externalities considered in the handbooks includes air pollution, climate change, noise, accidents and congestion. A minor role is played by impacts on crop losses, material and building damages and biodiversity. The guidelines provide—for each key externality—the range of unitary external costs values and the methodological assumptions behind the calculation, which can be used to transfer/adjust the monetary valuations in different contexts.
2. Tools for the measurement and evaluation of urban sprawl: There is a consolidated tradition in Europe (EEA 2016) concerning the measurement and evaluation of urban sprawl effects (e.g., in the area of infrastructure provision and management of public services). From this stream of research indicators and metrics are made available, supporting the assessment of urban sprawl impacts and the identification of key variables for the monitoring of urban sprawl dynamics.
3. Contingent valuations and meta-analyses for the loss of biodiversity and amenities: This stream of research provides evaluations from case studies and meta-analyses concerning the quantification (monetary valuation) of biodiversity services, for which quantification is uncertain and generally lacking. These studies also address uncertainties and caveats for the transferability of results in contexts different from the original case study.

6. Conclusions

As previously mentioned, the 12 main features of a socially integrative city are identified and discussed in (TRANS-URBAN EU-CHINA 2018). Accordingly, answering the initial question asked: “how can social cost–benefit analysis (SCBA) techniques and methodologies support the transition towards socially integrative cities in EU and China?” is best done by gauging the extent to which SCBA and its different approaches can contribute to the achievement of, or progress towards, each of these 12 features.

Table 2, therefore, summarises these contributions and provides a rough indication of their actual relevance to social integration, distinguishing between (i) high relevance, (ii) medium relevance, and (iii) limited or indirect relevance.

Table 2. Characteristics of a socially integrative city and potential contributions from SCBA guidelines and tools. Source: own elaboration

Characteristics and Priorities of the Socially Integrative Cities	Potential EU SCBA Contribution Approaches
1. Reducing urban sprawl and promoting well-balanced land conversion from “rural” to “urban” and appropriate access to urban land	High relevance: tools for the measurement and evaluation of urban sprawl may provide supporting evidence to the cost of urban sprawl, informing urban planners and policymakers on land use policies.
2. Involving the different stakeholders in collaborative and participative planning and design processes on the different politico-administrative levels	Medium relevance: multicriteria decision analysis approaches, considering views and values of multiple stakeholders, may support participative processes at different administrative levels.
3. Improving the environment and living conditions in urban areas	High relevance: methodologies and guidelines for the evaluation of externalities from transportation activities can provide the quantification of costs and damages to the urban environment, providing evidence for urban policies improving the quality of life.
4. Upgrading the physical environment in distressed areas	Medium relevance: the evaluation of externalities from built environment can support the identification of distressed areas, supporting the upgrading.
5. Promoting efficient and affordable urban transport	Medium relevance: Methodologies and guidelines for the evaluation of externalities from transportation activities can evaluate the public transport full cost (external plus operational costs), providing a contribution to the definition of affordability and equity policies.

Table 2. *Cont.*

Characteristics and Priorities of the Socially Integrative Cities	Potential EU SCBA Contribution Approaches
6. Assuring equal access to municipal services	Medium relevance: Tools for the measurement and evaluation of urban sprawl can assess the management costs of municipal services in different urban forms; being supportive to the definition of equal access and fairness policies to municipal services.
7. Strengthening the local economy and labour market	Limited or indirect relevance: SCBA can only provide indirect support to the socio-economic evaluation of policies addressing labour market and local economy.
8. Strengthening (technical and social) innovation in cities and neighbourhoods opening up new possibilities for the local population	Medium relevance: multicriteria decision analysis approaches, considering views and values of multiple stakeholders, may pave the way towards new possibilities, disclosing local population needs and demands.
9. Fostering proactive education and training policies for children and young people in disadvantaged neighbourhoods	Limited or indirect relevance: SCBA can only provide indirect support to the socio-economic evaluation training policies for children and young people.
10. Preserving cultural heritage and fostering the identity of neighbourhoods and their inhabitants	Medium relevance: Contingency values and meta-analysis for the loss of biodiversity and amenities can provide reference values and case studies on the monetisation of biodiversity and cultural values, providing support to policy makers and local communities.
11. Fostering social capital and engagement of local stakeholders	Medium relevance: multicriteria decision analysis approaches, considering views and values of multiple stakeholders, may support the engagement of local stakeholders.
12. Supporting adequate institutional and financial conditions and mechanisms	Medium relevance: Methodologies and guidelines for the evaluation of externalities from transportation activities can support pricing policies (e.g., the determination of tariffs for using transport services) contributing to the preparation of adequate financial frameworks.

Author Contributions: Conceptualization and Introduction, R.A.R.; Material and Methods for the Application of SCBA in Urban Planning and Governance in Europe, R.E.; Material and Methods for the Application of SCBA in Urban Planning and Governance in China, E.M.

Conflicts of Interest: The authors declare no conflict of interest.

References

Ando, Amy Whritenour, and Noelwah R. Netusil. 2013. A Tale of Many Cities: Using Low-Impact Development to Reduce Urban Water Pollution. *Choices* 28: 1–6.

- Burchell, Robert, George Lowenstein, William Dolphin, and Catherine Galley. 2002. *The Costs of Sprawl—2000*, TCRP Report 74, Transportation Research Board (www.trb.org). Available online: http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_74-a.pdf (accessed on 15 December 2020).
- CCCC (Central Committee of the Chinese Communist Party). 2014. *National Urbanization Plan for 2014–2020*. Beijing: CCCC.
- CE Delft. 2019. *Handbook on the External Costs of Transport*. EU. Available online: https://www.cedelft.eu/publicatie/external_costs_of_transport_in_europe/1258 (accessed on 10 December 2020).
- EEA. 2016. *Urban Sprawl in Europe*. Copenhagen: EEA.
- Ford, Jonathan. 2010. *Smart Growth & Conventional Suburban Development*, EPA U.S. Environmental Protection Agency, Morris Beacon Design. Available online: <https://19january2017snapshot.epa.gov/sites/production/files/2014-07/documents/mbd-epa-infrastructure.pdf> (accessed on 18 November 2020).
- Förster, Johannes, Stefan Schmidt, Bartosz Bartkowski, Nele Lienhoop, Christian Albert, and Heidi Wittmer. 2019. Incorporating environmental costs of ecosystem service loss in political decision making: A synthesis of monetary values for Germany. *PLoS ONE* 14: e0211419. [CrossRef] [PubMed]
- Houkai, Wei. 2011. *Strategy of urban transformation in China*. Beijing: Institute for Urban and Environmental Studies, Chinese Academy of Social Sciences.
- Jin, Xue. 2008. *Study on the Stage Characteristics of the Negative Externalities of Urban Transportation and Govern Policies*. Beijing: BJTU (Beijing Jiaotong University).
- Kramer, Melissa G. 2013. *Technical Review of the Interactions Among Land Use, Transportation, and Environmental Quality*; Washington: EPA U.S. Environmental Protection Agency. Available online: https://www.epa.gov/sites/production/files/2014/04/documents/ourbuilt_webinar_07242013.pdf (accessed on 5 July 2020).
- Liu, Ling, Ai'hua Wang, and Yueji Zhu. 2018. An investigation on the negative externality of “Migratory Bird” care of the aged in Hainan and its elimination strategy. *Special Zone Economy* 349: 13–17.
- Latinopoulos, Dionysis, Zisis Mallios, and Pericles Latinopoulos. 2016. Valuing the benefits of an urban park project: A contingent valuation study in Thessaloniki, Greece. *Land Use Policy* 55: 130–41. [CrossRef]
- Litman, Todd. 2015. *Analysis of Public Policies That Unintentionally Encourage and Subsidize Urban Sprawl*. NCE Cities—Sprawl Subsidy Report. Available online: <https://lsecities.net/wp-content/uploads/2015/03/NCE-Sprawl-Subsidy-Report-021.pdf> (accessed on 15 December 2020).
- Mingfei, Ma. 2012. *Land Readjustment Model for the Urban Fringe Area in Beijing and Its Application*. Cambridge: Department of Architecture, Cambridge University.
- Nabielek, Kersten, David Adrianus Franciscus Hamers, and David Victor Harmen Evers. 2016. *Cities in Europe Facts and Figures on Cities and Urban Areas*. Brussels: European Commission.

- NEEDS (New Energy Externalities Developments for Sustainability). 2009. *Value Transfer Techniques Deliverable n° 2.1 - RS 3a*. Bruxelles: European Commission.
- Pandeya, Bhopal, Wouter Buytaert, Zed Zulkafli, Timon Karpouzoglou, Feng Mao, and David M. Hannah. 2016. A comparative analysis of ecosystem services valuation approaches for application at the local scale and in data scarce regions. *Ecosystem Services* 22: 250–59. [CrossRef]
- Ricardo-AEA. 2014. Update of the Handbook on External Costs of Transport. EU. Available online: https://ec.europa.eu/transport/sites/transport/files/handbook_on_external_costs_of_transport_2014_0.pdf (accessed on 15 March 2020).
- Stevenson, Mark. 2016. Land Use, Transport, and Population Health: Estimating the Health Benefits of Compact Cities. *Lancet* 388: 2925–35. Available online: [http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736\(16\)30067-8.pdf](http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(16)30067-8.pdf) (accessed on 7 June 2020). [CrossRef]
- TRANS-URBAN EU-CHINA. 2018. Deliverable 3.1 “Report on the Current Framework and Situation of Urban Renewal, Urban Expansion as well as Land Management and Banking (Incl. Land Administration) in China and Europe”, p. 80. Available online: http://transurbaneuchina.eu/fileadmin/user_upload/tuec/files/results/TRANS-URBAN-EU-CHINA_D_3.1_IOER_20190113_v_3.0.pdf (accessed on 15 March 2020).
- Zong, Gang, and Cong Li. 2014. Quantitative analysis and calculation of the negative externality of Beijing transportation system. *Ecol Econ* 30: 57–63.
- World Bank, and The Development Research Center of the State Council, P. R. China. 2014. *Urban China: Toward Efficient, Inclusive, and Sustainable Urbanization*; Washington, DC: World Bank. [CrossRef]

© 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Regression Analyses of Air Pollution and Transport Based on Multiple Data Sources—A Decision Support Example for Socially Integrative City Planning

Mingyue Liu, Buyang Cao, Mengfan Chen, Otthein Herzog, Edna Pasher, Annemie Wyckmans and Zhiqiang Wu

1. Introduction and Related Work

Socially integrative cities are defined as “socially mixed, cohesive, liveable and vibrant. Compactness, functional mix, and intra-urban connectivity as well as equal rights regarding the access to municipal services play an important role. Environmental quality, the quality of public spaces and the quality of life contribute to the well-being of the population. Strengthening a sense of community and fostering a sense of place as well as pre-serving cultural heritage shape the city’s in- and outward-bound image. Investments into neighborhood improvement, service delivery, infrastructure and the quality of housing are important supportive measures. Empowerment and participation of the population, as well as social capital, are indispensable.” (Müller et al. 2019, p. 1, emphasis added).

The quality of the air in a city is one of the most important environmental qualities which is also emphasized by the air pollution measurement stations in cities all over the world. The impact of outdoor air pollution on the health of city populations is huge (Cohen et al. 2005). The air quality in a city influences the health of the people in the city in general (WHO n.d.), with living quarters being in close proximity to busy roads and/or industry conglomerates. A recent research preprint (Wu et al. 2020) demonstrates that even small increases in fine particulate matter (PM_{2.5}) had an outsized effect in the US, and that an increase of 1 µg/m³ corresponded to a 15% increase in COVID-19 deaths. This result is supported by another recent preprint (Travaglio et al. 2020) where current SARS-CoV-2 cases and deaths recorded for several sites across England were compared with public databases to both regional and subregional air pollution data. The levels of nitrogen oxide and sulphur dioxide as markers of poor air quality are associated with increased numbers of COVID-19-related deaths across England. Particulate matter could also contribute to increased infectivity—the relative contributions of individual fossil fuel sources on key air pollutant levels have also been analysed and it was found that the levels of some air pollutants are linked to COVID-19 cases and adverse outcomes.

The formation of air pollution is complex and has yet to be fully understood (Yu et al. 2014). Motor vehicle traffic emissions contribute a significant proportion of

pollutants in cities globally, particularly in some developing countries. In China, the situation is serious, especially due to the high PM_{2.5} and PM₁₀ concentrations in the ambient air of a number of regions (Chen et al. 2017). The linkage between air quality and transportation has been evidenced by certain previous studies. Hu et al. (2017) proposed an index called the Mutual Information of Air Quality-Traffic-Meteorology Index to describe the combined effects of meteorology and traffic restrictions. Karner et al. (2010) found that different pollutant concentrations had significant different near-roadway dispersion mechanisms. Wang et al. (2019) proposed the mechanism of air pollution terrain nexus. Research has suggested the complexity of air pollution and the multiple influential factors in cities (Liu et al. 2019). Studies disclosed that the concentration of PM_{2.5} had a strong spatial correlation with SO₂ emissions, inversion temperature, GDP, and population density (Yao et al. 2019). Emission control has reduced the concentrated level of PM to some extent lately, but unfortunately unfavourable weather and climate partially counteract the emission control effects (Wang et al. 2019).

In order to be able to monitor and improve the air quality in the cities, it is important to analyse the huge amount of air quality data in order to determine spatiotemporal features and causes of pollution.

Kang et al. (2018) describe an overview on the current methods for the analysis of air quality and concentrate on reviewing Big Data analytics and machine learning approaches to determine the multidimensional factors influencing air pollution and make air quality predictions. They describe five data-driven approaches from South Africa, Western USA, Malaysia, and two from China, all of which concentrate on singular air pollution components such as smoke, NO₂ or PM₁₀. All of them use statistical models. For the prediction of air pollution, discussed approaches of machine learning were used, such as Artificial Neural Networks (ANNs), a combination of an ANN and a genetic algorithm, random forest model, decision tree model, least squares support vector machine model, and spatiotemporal deep learning model for the areas of Greece, Japan, Macau, and three from China. Five of them used one air quality factor and one used two factors. Based on the comparably meagre results, the authors (Kang et al. 2018, p. 8) describe a “Need #2: Research and development of real-time air quality monitor and evaluation systems supporting air quality evaluation and analysis on multiple levels. This demand is caused by the lack of the existing research work addressing the air quality impacts on different levels due to air pollution from a special air source. This suggest[s] the demand on an integrated real-time air quality monitor and evaluation system based on sensor networks and IoT infrastructures at the different levels”.

Ye and Ou (2019) used statistical methods to analyse Air Quality Index (AQI) data for determinants and spatiotemporal patterns of air quality in the Yangtze Delta region of China, a densely populated urban agglomeration with a population of

more than 220 million, in the years from 2014 to 2016. For the examined areas, they could determine that industrialization, urbanization, total energy consumption and population agglomeration were the most important factors causing air pollution.

Xu et al. (2019) examined the spatiotemporal patterns and the influence of meteorological and socio-economic factors of air pollution in north China based on the daily Air Quality Index of 96 cities from 2014 to 2016. They used statistical analysis and the exploratory spatial data analysis-geographically weighted regression ESDA-(GWR) model. Their analysis shows that on an annual scale, car ownership and industrial production are positively correlated with air pollution. The increase in wind speed, per capita gross domestic product (GDP), and forest coverage leads to reductions in pollution.

The next sections will show that the urban air quality is correlated with urban size, population, industrial infrastructures, shopping centres, and transportation facilities. The insights gained through the models and analyses provide an evidence base for decision-making to ensure a sustainable urban development with respect to air pollution. The analytical results also form the basic framework for testing, monitoring, benchmarking and assessing impacts of the digital urban transition in China, and the associated technologies may be extended to other parts of the world, even if they would be used only for an early warning of potentially dangerous air pollution.

2. Data and Analysis Methods

2.1. Air Quality and Transportation Data in Tianjin

Using Tianjin as an example, we study the correlations between air pollution and transportation (traffic) as well as other factors based on multiple data sources. The analytics will take additional factors into account as well as transportation to explore the inter-relationships of air quality, industrial entities, daily-life activities, and transportation with annual, monthly and real-time data.

Tianjin, located in the east-central coast of China, is one of four municipalities directly under the Central Government of China with a permanent population urbanization rate of 84% in 2020 over an area of 11,760 km² (TJ People 2020), with 16 districts and 240 towns and townships. Tianjin is one of the core cities in the Beijing–Tianjin–Hebei Metropolitan Region, and one of the regions bearing the most air pollution in China. Furthermore, from 2013 to 2017, Tianjin experienced a rise in transportation infrastructure development and an expansion in mechanized road cleaning as the built area of Tianjin expanded to about 145% the size of that in 2013 (National Bureau of Statistics 2019). Based on the data statistics, over 85% of all roads in Tianjin were covered by mechanized road cleaning in 2017 (National Bureau of Statistics 2019).

With respect to air quality data, concentrations of gaseous pollutants and fine particles (NO_2 , O_3 , SO_2 , CO , $\text{PM}_{2.5}$, PM_{10}) were obtained from the Platform for AQ Intelligent Management (Zenqi 2019). Monthly air quality data ranging from December 2013 to February 2019 and real-time air quality data of Tianjin were collected three times a day (8:00, 13:00, and 18:00) during a period of half a month. Annual transportation data from 2013 to 2017 were obtained from the China Statistical Yearbook. Figure 1 illustrates that from 2014 to 2018, the Air Quality Index (AQI) in Tianjin reveals a significant decreasing trend and the annual minimum value also tends to decline.

Furthermore, the pattern of the average monthly AQI (the values were determined according to the standards issued by the Chinese government) in Tianjin is U-shaped over the course of a year—that is, it is high in winter and falls to low values in spring and summer. In October, the AQI value starts to show an upward trend, and it reaches its peak in December of the same year; then it gradually declines from February of the next year onwards. However, the U shape becomes inconspicuous in 2017 and 2018.

The real-time air quality data were collected from 15 air quality monitoring stations in Tianjin (Table 1), whose locations are depicted in Figure 2.

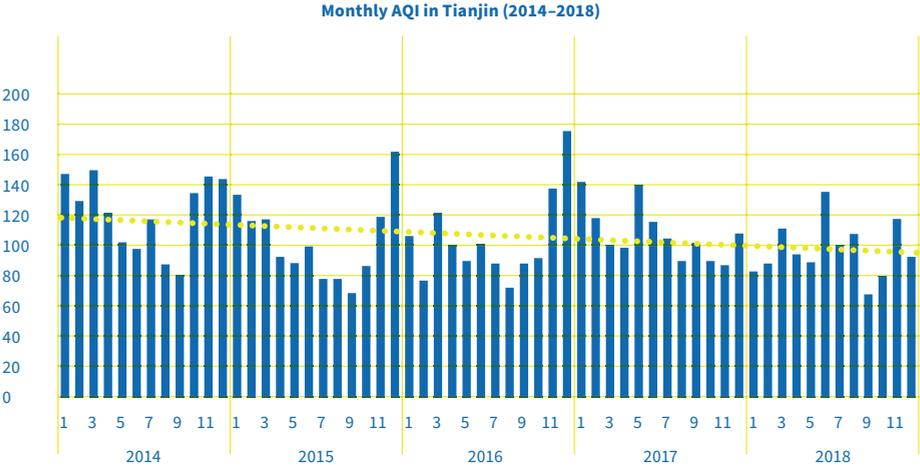


Figure 1. Monthly Air Quality Index (AQI) in Tianjin (2014–2018). Source: Figure by authors based on data from (Zenqi 2019).

Table 1. Real-time air quality data samples. Source: (Air Pollution in Tianjin 2019).

Data	Time	No.	Station	AQI	Comprehensive AQI	PM _{2.5}	PM ₁₀	SO ₂	NO ₂	CO	O ₃
2019/4/27	08:00	1	Tuanbo	112	5.88	84	82	10	71	1.2	11
2019/4/27	08:00	2	West 4th	100	6.06	75	89	13	80	1.4	12
2019/4/27	08:00	3	Binshui	99	4.91	74	59	8	59	0.7	27
2019/4/27	08:00	4	Jingu	99	5.79	74	95	8	76	0.7	17
2019/4/27	08:00	5	Yuejin	97	5.81	72	78	13	75	1.7	20
2019/4/27	08:00	6	Qinjian	83	4.18	61	58	4	46	0.4	46



Figure 2. The air quality monitoring stations in Tianjin. Source: Figure by authors based on (Zenqi 2019).

The website AMap provides real-time average traffic speeds on 1843 road segments in Tianjin, which is depicted on a map shown in Figure 3, where the units are km/h.

2.2. Industrial POI Data in Tianjin

From AMap, the locations of industrial Points of Interest (POIs) of construction, machinery and electronics, chemical and metallurgy, mining, and other types of manufactures in Tianjin can be obtained. According to the collected data, there are over 9000 industrial POIs including more than 4000 factories, 505 chemical and metallurgy companies, 30 mining companies, 2644 machinery and electronics companies, and 1806 construction entities. The results of a kernel density analysis for each kind of POI are shown in Figure 4 below (the cell size is 2.3×2.3 km); the darker the colour is, the more facilities are located there.



Figure 3. Real-time traffic of Tianjin on 2019-04-26 at 7 p.m. Source: AMap (2019).

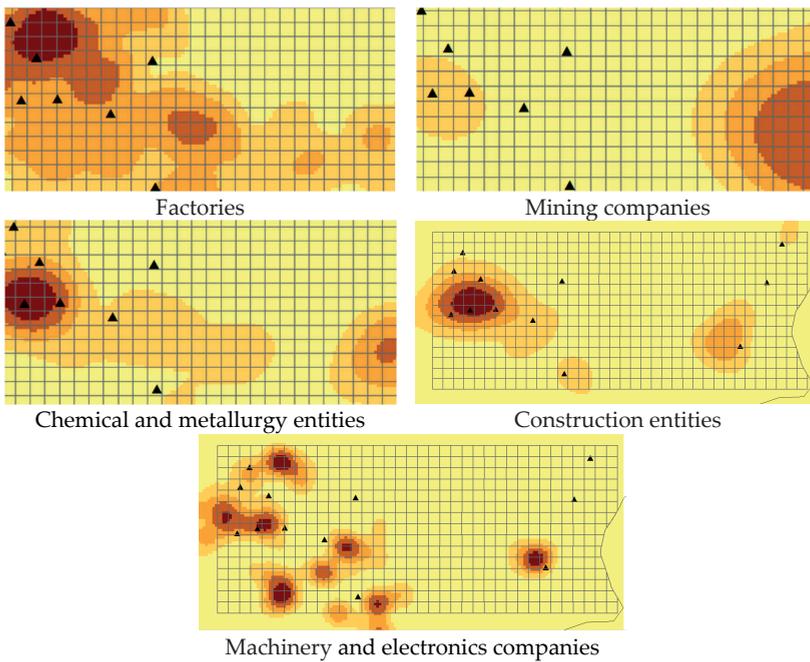


Figure 4. The kernel densities of various industrial POIs of Tianjin. Source: Figure by the authors.

2.3. Correlation Analyses

Correlation analyses were carried out to reveal the relationship between air quality (AQI) and transportation (traffic). However, the correlation analyses did not present very useful information if only transportation (traffic) data were used as the factor impacting the AQI. In order to gain better insights into the causes of air pollution, more data had to be incorporated into the analytical model. All analytical results will be discussed in more detail in Section 3.

2.3.1. Multisource Data Processing and Integration

Figure 5 depicts the real-time traffic data for 1843 road segments together with the industrial POIs in the city of Tianjin.

To facilitate the analysis, the urban area of Tianjin was divided into 3398 grid cells with a size of 2.3×2.3 km as previously explained. Among 15 air quality monitoring stations, 12 stations were chosen that are located in the central area and the Binhai new district of Tianjin to create 12 Tyson polygons (Figure 6). These Tyson polygons cover an area of 2827.38 km², including 537 grid cells. Within these grid cells, there are 27 mining companies, 359 construction companies, 73 machinery companies, 284 chemical companies, and 924 manufacturing factories.

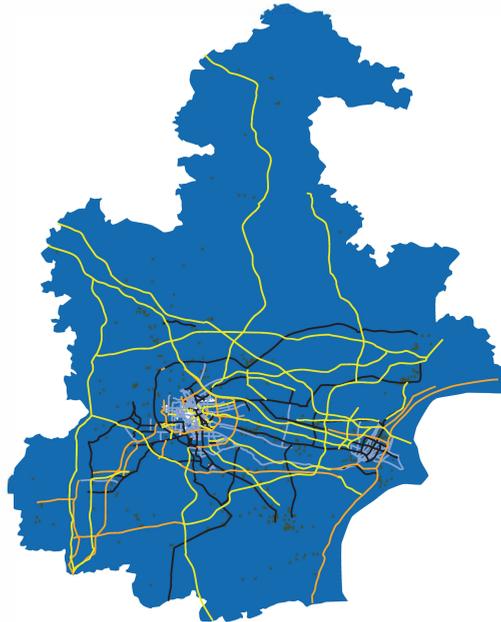


Figure 5. Real traffic and industrial POIs in Tianjin. Source: Figure by authors.

Then, real-time traffic and AQI data were assigned to the grid cells where grid cells in the same Tyson polygon were assigned the same AQI value provided by the monitoring station in this polygon. Grid cells intersecting with multiple road segments were assigned the average traffic speed of those road segments at that moment. POIs in each grid cell were counted and also integrated into the data model.

To compare the similarities (patterns) between the air quality time series and the ones of traffic (speeds) in every grid cell, the dynamic time warping (DTW) (Keogh and Pazzani 2001) method was applied. DTW is a time series comparison technique that can essentially be employed to compare any data that are represented as one-dimensional sequences. Here, DTW was utilized to compare the similarity between traffic (speed) and AQI time series; the results will be discussed in Section 3.



Figure 6. Tyson polygons built upon the air monitoring stations. Source: Figure by authors.

2.3.2. Other Impact Factor Considerations

The AQI in a region may be impacted by traffic conditions and the activities of the industrial entities in the neighbourhood. Motor vehicles are known for their emissions of CO, NO_x and particulate matter (PM). Industrial entities are also known as the main sources of air pollution in built areas.

To study their influences on the AQI in Tianjin, a multivariate regression model was conceived to gain insight into how the traffic and industrial entities impact the AQI. All data were normalized into the [0, 1] interval. Furthermore, the data were grouped by three points of time of a day—namely, 8 a.m., 1 p.m., and 6 p.m. The data groups of different time periods were fed to the multivariate regression model to determine the impacts of traffic and industrial entities on the air quality in Tianjin.

2.4. Prediction Model for AQI

According to the average monthly AQI data, the AQI has a seasonal pattern. Therefore, the Holt–Winters method was applied to smooth the data. Seasonality was defined as the trend of time series data, which shows the behaviour of the monthly AQI repeating the U-shape by year (Exponential Smoothing 2021).

The Holt–Winters method calculates the dynamic estimates for the three components: level, trend, and seasonal components, which are based on the following formulae:

$$a_t = \alpha[y_t - c_t(t-s)] + (1-\alpha)[a_{t-1} + b_{t-1}] \quad (1)$$

$$b_t = \beta[a_t - a_{t-1}] + (1-\beta)b_{t-1} \quad (2)$$

$$c_t = \gamma[y_t - a_t] + (1-\gamma)c_{t-s} \quad (3)$$

where a_t is the intercept, b_t indicates the trend, and c_t represents the seasonal factor. Then, the smoothed sequence y_t is determined by the following formula (supposing to predict the k th time period from t):

$$\hat{y}_{t+k} = a_t + b_t k + c_{t+k-s} \quad (4)$$

The three damping factors in the prediction formula: α, β, γ , ranging from 0 to 1, were selected through multiple experiments, whereas s is the length of the season chosen to be 12 here. The prediction results are presented and discussed in detail in the section below.

3. Analytics of Air Quality

3.1. Correlation Analysis

According to the collected data and our study, the air quality of Tianjin has an improving trend every year. The air quality has improved over the last several years due to the actions taken for environmental protection. The air quality of Tianjin is negatively correlated with public transportation. That is, the more public transportation provided, the better the air quality. In addition, it is interesting to note that public transportation construction projects in Tianjin had the strongest impact on SO_2 and the weakest impact on NO_2 . The results of the associated correlation analytics are shown in Figure 8 (Figure 7 illustrates the legend used in the correlation matrix of Figure 8). In Figure 8, *road_area* indicates the total road area (km^2) in Tianjin, while *road_clean_area* represents the road area (km^2) cleaned by street sweepers in Tianjin.

3.2. Real-Time and Multisource Data Analyses

As discussed above (Section 2.3.1), the DTW model can be applied to identify the similarity between the AQI and real-time traffic time series (vehicle speeds on the underlying road segments). The results of the DTW analyses are listed in Table 2. For each attribute (AQI, $PM_{2.5}$, PM_{10} , SO_2 , NO_2 , CO), the smaller the value of the DTW, the more similar it is to the traffic time series data. It is obvious that the pattern of the road speeds in Tianjin is more similar to those of $PM_{2.5}$, AQI, and NO pollutants.

To analyse more precisely the impact factors on AQI in a city, a multivariate linear regression model was applied to the real-time AQI data, road speeds, and industrial POI data to obtain the proportion of traffic and industrial POI impacts on the AQI in the morning, midday and in the evening of a day.

As the results shown in Table 3, it can be observed that at 8am in the morning the biggest impact on the AQI originates from chemical enterprises and manufacturing plants, while at 1 PM, chemical enterprises, and machinery enterprises have the greatest influence on the AQI. Furthermore, at 6pm, the biggest impact on the AQI originates from traffic machinery enterprises, which is consistent with the work shifts of these types of businesses. In general, chemical and machinery enterprises, as well as manufacturing plants, have the most significant influence on the air quality, albeit the impact of chemical and machinery enterprises on air quality varies greatly over the course of a day. These outcomes provide great insight into the how the industrial structure impacts on the air quality as well as how the measure should be taken in order to improve the air quality.

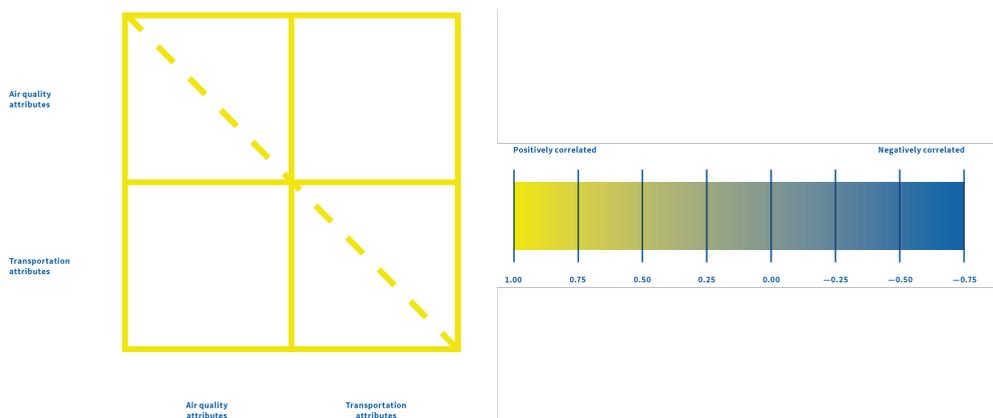


Figure 7. Legend of correlation matrix. Source: Figure by authors.

Air Quality & Transportation Correlation - Tianjin

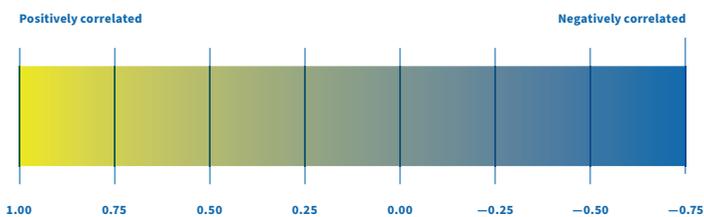
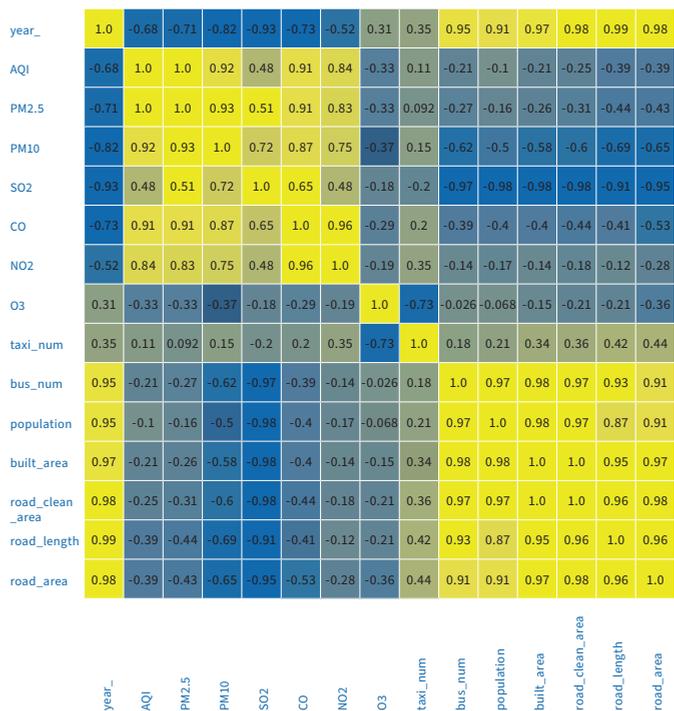


Figure 8. Correlation matrix of air quality and transportation attributes. Source: Figure by authors.

Table 2. Results of the dynamic time warping (DTW).

AQI	PM _{2.5}	PM ₁₀	SO ₂	NO ₂	CO
14.9028	11.9799	22.5378	27.7433	18.1325	31.628

Table 3. Results of multivariate linear regression.

Time	Speed	Chemical Company	Manufacturing Factory	Machinery Company	Construction Company
8:00 a.m.	0.636	6.297	5.84	-0.737	0.177
1:00 p.m.	-3.041	17.02	-0.131	4.373	-0.487
6:00 p.m.	2.456	-50.736	-2.007	5.863	-10.317

3.3. AQI Predictions

After the impact factors were analysed as mentioned above, we were able to build the model to predict the AQI. The Holt–Winters approach-based prediction model was applied and the monthly average AQI values from December 2013 to February 2019 with a total of 63 samples containing the trends and seasonality were employed. Starting from the 50th data point, the AQIs for the next 20 points of time can be predicted. According to the similarity between the predicted and the actual values, the accuracy was within 95%. The prediction also shows that the U-shaped trend is stable over the course of a year, and that the maximum and minimum values of the AQI are decreasing gradually, which also coincides with reality. The results are illustrated in Figure 9, where the x-axis denotes the months while the y-axis indicates the AQI. The accuracy measures are defined by: Mean Absolute Percentage Error (MAPE), Mean Absolute Deviation (MAD) and Mean Signed Difference (MSD).

4. Cost Model for Air Pollutants

In 2014, the Chinese Government proposed a strategy for the coordinated development of Tianjin, Beijing and Hebei. The three cities are adjacent to each other, and all of them are population-intensive cities. Therefore, through the implementation of measures such as transportation integration, ecological environmental protection and industrial upgrading and transfer, the economic development and environmental protection of the three cities can be improved.

In terms of air pollution control, considering the diffusion of air pollutants, there will be spill-over effects between adjacent areas (Keogh and Pazzani 2001). Therefore, comprehensive consideration of the three cities and the implementation of regional collaborative environmental governance can reduce the cost due to air pollutants. In order to guide cities to establish a more effective mechanism of air pollution prevention and minimize the cost of air pollution control, we tried to build a cost model to reduce air pollutants of Tianjin as a prototype and we hope the resultant cost model can assist the decision-makers to make more reasonable (both economic and efficient) decisions.

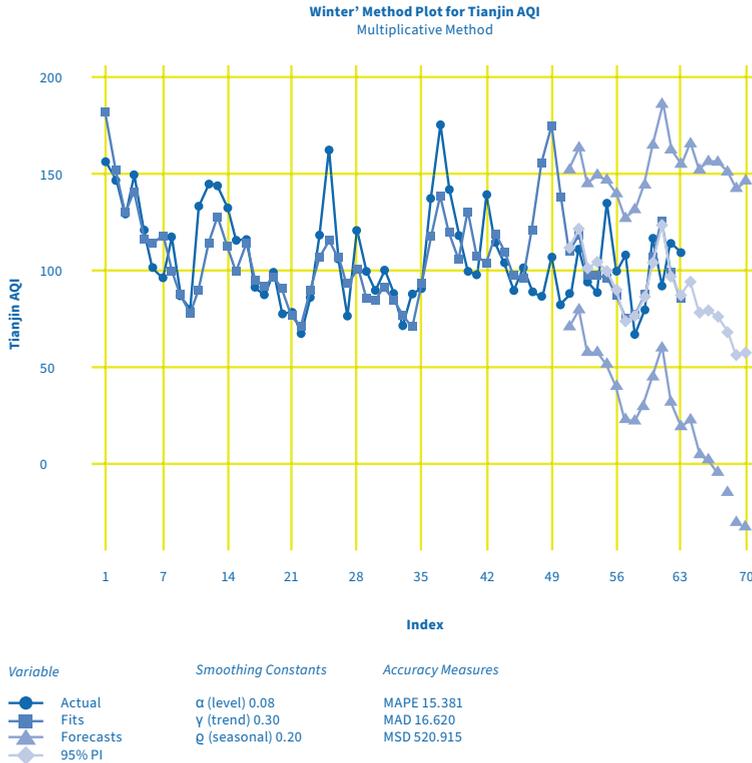


Figure 9. Prediction results for the AQI. Source: Figure by authors.

4.1. Definition of Parameters

According to the research of the World Bank (Johnson et al. 1997), we decided to choose three major factors to build the cost model for reducing air pollutants: the annual emissions of main pollutants (T), the total annual emission of air pollutants (E) and regional characteristics (W), which represent the regional economy, industrial structure as well as the pollution control technology levels and could be considered as a constant term.

$$C = f(T, E, W) \quad (5)$$

where C is the cost of emission/air pollution reduction.

The table below (Table 4) shows relevant data of the three factors (to build the model for air pollution reduction) of Tianjin from 2011 to 2017, together with the associated cost C released by the National Bureau of Statistics of China.

4.2. Logarithmic Regression Result

With reference to the results of the World Bank policy research bureau (Poon et al. 2006), the fixed elastic function was selected to simplify this model:

$$C = \varphi \times T^\alpha \times E^\beta \times W \quad (6)$$

where φ , α , β are the hyperparameters of the model. To ensure the efficiency of the calculations, we adapted logarithmic regression analysis (Formula (7)), and Table 5 below summarizes our analysis results.

$$\ln C = \ln \varphi + \alpha \ln T + \beta \ln E + \ln W \quad (7)$$

$$\ln \theta = \ln \varphi + \ln W \quad (8)$$

Table 4. Impact factors for cost model. Sources: National Bureau of Statistics (2019) and Zenqi (2019).

Indicator	2017	2016	2015	2014	2013	2012	2011
SO ₂ (ton)	55,643.87	70,614.09	185,900.4	209,200	216,832.1	224,521.4	230,900
NO _x (ton)	142,265	144,748.6	246,800	282,300	311,719.3	334,222.6	358,900
PM (ton)	65,191.22	78,144.13	100,685.7	139,511.5	87,456.88	84,064	75,922.53
Total (ton)	263,100.1	293,506.9	533,386.2	631,011.5	616,008.2	642,808	665,722.5
C: Local government expenditure on environmental protection (billion CNY)	110.22	65.63	73.1	57.93	48.44	38.49	32.24

Table 5. Analytical results. Source: Data by authors.

Indicator	ln(T)	P	ln(E)	P	ln(θ)	P	R ²
SO ₂	-4.11	0.489	2.35	0.544	29.2	0.371	32.92
NO _x	3.21	0.12	-3.92	0.079	9.81	0.068	68.62
PM	-0.983	0.059	1.309	0.098	1.22	0.847	65.39

According to the logarithmic regression analysis presented above, NO_x has the most significant effect on the cost of reducing the pollutants, though PM is an important factor. By applying the analytical results, we were able to derive the cost function associated with NO_x emissions in Tianjin as follows:

$$C = e^{9.81} \times T^{3.21} \times E^{-3.92} \quad (9)$$

The formula states that the cost elasticity coefficient of NO_x emissions in Tianjin is -3.92 , which means that every 1% reduction in NO_x emissions in Tianjin requires an increase of 3.92% in the cost to control air pollution. To decrease the emission of air pollutants, we may take into account that stricter emission standards and the promotion of new energy vehicles should be adopted to control the emissions of NO_x on a larger scale, instead of merely purifying the air after pollution. The latter might not be so effective.

Based upon the model and the analysis, it is shown that SO_2 and PM pollutants from the industry are not the biggest factors affecting Tianjin's air quality, even though some actions were taken in this respect by request of the central government such as industrial upgrades in the region, the regional transfer of heavily polluting industries, and the usage of renewable energy for heating. Nitrogen oxides emitted by motor vehicles are one of the main causes of regional air pollution and it is significantly costly to perform a posterior clean-up according to our model. To reduce air pollutants more effectively, we may consider adopting stricter emission standards and promoting new energy vehicles to lower NO_x .

5. Conclusions

In this case study, the methods for unearthing the inter-relationship between air quality, transportation, and industrial air pollutants were applied to conduct the analyses for annual, monthly and real-time data together with additional attributes drawn from the datasets collected for the city Tianjin. The analyses reveal that transportation (traffic) time series data are very consistent with those of $\text{PM}_{2.5}$, AQI and NO_2 pollutants. This means that transportation has a big influence on air quality. In addition, the analyses based on real-time data plus relevant POIs of different industries reveal that the impacts of industrial entities on air quality vary significantly over the course of a day, and that they dominate the AQI. An AQI model based on the Holt–Winters method is proposed, which shows its accuracy in predictions.

To assist decision-makers in making more effective decisions, a cost model is developed that assists decision-makers to determine how to reduce air pollutants in a city more effectively.

This case study provides a framework to assist a city administration to improve its air quality via the following steps:

- analysing and visualizing the air quality over time;
- determining its causes (traffic, industry) and spatiotemporal distribution;
- determining the areas with a need to be improved;
- determining the cost for the air pollutant reduction.

It is conceivable that the combination of these steps delivers a comprehensive, data-driven, and evidence-based decision support procedure for a targeted improvement of the air quality, which would be impossible without these data analyses.

Author Contributions: Conceptualization, Zhiqiang Wu, Edna Pasher and Annemie Wyckmans; Methodology, Buyang Cao and Otthein Herzog; Software, Mingyue Liu and Mengfan Chen; Validation, Buyang Cao; Data Curation, Buyang Cao, Mingyue Liu and Mengfan Chen.; Writing—Original Draft Preparation, Buyang Cao, Mingyue Liu, Mengfan Chen and Otthein Herzog; Writing—Review and Editing, Buyang Cao and Otthein Herzog. All authors have read and agreed to the published version of the manuscript.

Funding: This research has received funding from the European Union’s Horizon 2020 Research and Innovation Programme under Grant Agreement No. 770141. The material reflects only the authors’ views and the European Union is not liable for any way that the information contained herein is used.

Conflicts of Interest: The authors declare no conflict of interest. The funding sponsors had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, and in the decision to publish the results.

References

- Air Pollution in Tianjin. 2019. Real-time Air Quality Index Map. Available online: <https://aqicn.org/map/Tianjin/cn> (accessed on 18 June 2019).
- AMap. 2019. Available online: <https://lbs.amap.com/> (accessed on 26 April 2019).
- Chen, Li, Mengshuang Shi, Suhuan Li, Shuang Gao, Hui Zhang, Yanling Sun, Jian Mao, Zhipeng Bai, Zhongliang Wang, and Jiang Zhou. 2017. Quantifying public health benefits of environmental strategy of PM_{2.5} air quality management in Beijing–Tianjin–Hebei region, China. *Journal of Environmental Sciences* 57: 33–40. [CrossRef]
- Cohen, Aaron J., H. Ross Anderson, Bart Ostro, Kiran Dev Pandey, Michal Krzyzanowski, Nino Künzli, Kersten Gutschmidt, Arden Pope, Isabelle Romieu, Jonathan M. Samet, and et al. 2005. The global burden of disease due to outdoor air pollution. *Journal of Toxicology and Environmental Health Part A* 68: 1301–7. [CrossRef]
- Exponential Smoothing. 2021. Available online: https://en.wikipedia.org/wiki/Exponential_smoothing (accessed on 25 April 2021).
- Hu, Dongmei, Jianping Wu, Kun Tian, Lyuchao Liao, Ming Xu, and Yiman Du. 2017. Urban air quality, meteorology and traffic linkages: Evidence from a sixteen-day particulate matter pollution event in December 2015, Beijing. *Journal of Environmental Sciences* 59: 30–38. [CrossRef] [PubMed]
- Johnson, Todd M., Feng Liu, and Richard Newfarmer. 1997. *Clear Water, Blue Skies: China’s Environment in the New Century*. Washington, DC: The World Bank.
- Kang, Gaganjot Kaur, Jerry Zeyu Gao, Sen Chiao, Shengqiang Lu, and Gang Xie. 2018. Air quality prediction: Big data and machine learning approaches. *International Journal of Environmental Science and Development* 9: 8–16. [CrossRef]

- Karner, Alex A., Douglas S. Eisinger, and Deb A. 2010. Niemeier. Near-roadway air quality: Synthesizing the findings from real-world data. *Environmental Science & Technology* 44: 5334–44.
- Keogh, Eamonn J., and Michael J. Pazzani. 2001. Derivative dynamic time warping. In *Proceedings of the 2001 SIAM International Conference on Data Mining*. Philadelphia: Society for Industrial and Applied Mathematics, pp. 1–11.
- Liu, Huanjia, Hezhong Tian, Kai Zhang, Shuhan Liu, Ke Cheng, Shasha Yin, Yongli Liu, Xiangyang Liu, Yiming Wu, Wei Liu, and et al. 2019. Seasonal variation, formation mechanisms and potential sources of PM_{2.5} in two typical cities in the Central Plains Urban Agglomeration, China. *Science of The Total Environment* 657: 657–70. [CrossRef]
- Müller, Bernhard, Paulina Schiappacasse, Jianming Cai, Enpu Ma, and Qirui Li. 2019. *Theoretical Aspects of Transition towards Urban Sustainability and the Role of Socially Integrative Cities*. Deliverable D.6.6 of the EU Project Transition towards Urban Sustainability through Socially Integrative City. Report D.6.6. Dresden: Leibniz Institute of Ecological Urban and Regional Development.
- National Bureau of Statistics. 2019. Available online: <http://www.stats.gov.cn/> (accessed on 18 June 2019).
- Poon, Jessie P. H., Irene Casas, and Canfei He. 2006. The impact of energy, transport, and trade on air pollution in China. *Eurasian Geography and Economics* 47: 568–84. [CrossRef]
- Travaglio, Marco, Yizhou Yu, Rebeka Popovic, Nuno Santos Leal, and L. Miguel Martins. 2020. Links between air pollution and COVID-19 in England. *medRxiv*. [CrossRef]
- TJ People. 2020. Available online: <https://tj.people.com.cn/gb/n2/2017/0306/c375366-29810698.html> (accessed on 25 July 2020).
- Wang, Pengfei, Hao Guo, Jianlin Hu, Sri Harsha Kota, Qi Ying, and Hongliang Zhang. 2019. Responses of PM_{2.5} and O₃ concentrations to changes of meteorology and emissions in China. *Science of the Total Environment* 662: 297–306. [CrossRef] [PubMed]
- Wang, Xue-Chao, Jiří Jaromír Klemeš, Xiaobin Dong, Weiguo Fan, Zihan Xu, Yutao Wang, and Petar Sabev Varbanov. 2019. Air pollution terrain nexus: A review considering energy generation and consumption. *Renewable and Sustainable Energy Reviews* 105: 71–85. [CrossRef]
- WHO. n.d. Ambient Air Pollution: Health Impacts. Available online: <https://www.who.int/airpollution/ambient/health-impacts/en/> (accessed on 20 July 2020).
- Wu, Xiao, Rachel C. Nethery, Benjamin M. Sabath, Danielle Braun, and Francesca Dominici. 2020. Exposure to air pollution and COVID-19 mortality in the United States. *medRxiv*. [CrossRef]
- Xu, Wenxuan, Yongzhong Tian, Yongxue Liu, Bingxue Zhao, Yongchao Liu, and Xueqian Zhang. 2019. Understanding the spatial-temporal patterns and influential factors on air quality index: The case of north China. *International Journal of Environmental Research and Public Health* 16: 2820. [CrossRef] [PubMed]

- Yao, Youru, Cheng He, Shiyin Li, Weichun Ma, Shu Li, Qi Yu, Na Mi, Jia Yu, Wei Wang, Li Yin, and et al. 2019. Properties of particulate matter and gaseous pollutants in Shandong, China: Daily fluctuation, influencing factors, and spatiotemporal distribution. *Science of The Total Environment* 660: 384–94. [CrossRef]
- Ye, Lei, and Xiangjun Ou. 2019. Spatial-temporal Analysis of Daily Air Quality Index in the Yangtze River Delta Region of China During 2014 and 2016. *Chinese Geographical Science* 29: 382–93. [CrossRef]
- Yu, Shaocai, Qingyu Zhang, Renchang Yan, Si Wang, Pengfei Li, Bixin Chen, Weiping Liu, and Xiaoyu Zhang. 2014. Origin of air pollution during a weekly heavy haze episode in Hangzhou, China. *Environmental Chemistry Letters* 12: 543–50. [CrossRef]
- Zenqi. 2019. Available online: <https://m.zq12369.com> (accessed on 18 June 2019).

© 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Estimating the Replication Potential of Urban Solutions for Socially Integrative Cities

Loriana Paolucci

1. Introduction

In the previous chapters, the topic of sustainable transition toward socially integrative and sustainable cities was widely discussed and several tools and advanced methods were introduced as useful instruments to facilitate this process. All these tools are valid aids for urban planners and decision makers in implementing specific urban solutions. Often, however, the fact that a solution is successful in a given context does not necessarily imply that it can be easily replicated in completely different ones, bringing the same benefits. Notably, successful urban solutions in Europe could face various difficulties when implemented in the Chinese context. Thus, a thorough analysis of the replication potential is required for the selection of the most appropriate solutions for any given city.

This article illustrates a new methodology for the estimation of the replication potential of urban solutions in different contexts.

In the literature, there are several tools that are commonly associated and used in support of replication,¹ e.g., technical workshops, webinars, specific knowledge transfer events, business models, cities networks and platforms for sharing knowledge. Moreover, existing methodologies for assessing the replication potential of urban solutions are based on the characterization of European Cities and their clustering into specific target areas according to a set of indicators. These methodologies are very complex, as they rely on huge amounts of data that should be made available from cities and can be excellent starting points for this type of analysis (García-Fuentesa et al. 2017). Nevertheless, what is missing is a quantitative approach able to connect the context to the specific requirements of the solution to be applied.

The novelty of this method, developed by the author and published for the first time within this book, consists in the combination of context variables of the city with features proper of the solutions that the city aims to replicate. Quantitative data and qualitative information are collected from local stakeholders and then assessed according to five specific dimensions: Socio-cultural, Institutional, Technological,

¹ For example, the SmartEnCity replication toolkit, see https://smartencity.eu/news/detail/?rx_call=124 (accessed on 1 November 2020).

Environmental and Economic (SITEE replicability method). This process leads to a prioritization of solutions from the most to the least replicable based on a mathematical approach, which is a rather unusual feature among other methods.

Moreover, this multi-dimensional analysis allows the complexity of the different cities' ecosystems to be best described and understood, helping to identify the most relevant factors that may limit or facilitate replication. Cities are thus guided in the selection of those urban solutions that could be best replicated in their local context and are widely supported in the urban planning phase.

SITEE adopts a bottom-up approach, as it deals with the replication of individual measures and, therefore, does not allow the replication potential of integrated policies to be directly evaluated. However, individual measures are analysed by explicitly considering the context in which they are embedded and can thus be seen as useful building blocks towards a more systemic appraisal. Moreover, it must be pointed out that this horizontal approach can be applied to a wide range of urban solutions, from nature-based, going through technology based, including those pursuing social inclusiveness.

Furthermore, the flexibility in setting indexes and variables represents a powerful means for evaluating replicability in any local context and can produce effective results both when assessing EU measures to be potentially applied in the Chinese context, as well as the opposite case, or even when considering any other city outside Europe and China.

The first application of SITEE was carried out in the city of Wuhan, China, in Spring 2020.

From a basket of hundreds of EU eco-smart solutions, a selected group was identified matching the social integrative and inclusiveness criteria set out in one of the founding documents of TRANS-URBAN-EU-CHINA project (Müller et al. 2019), such as improving the environment and living conditions in urban areas, involving different stakeholders in collaborative and participative planning, promoting more efficient and affordable urban transport, etc.

The application of SITEE to the Chinese context might have interesting implications. China's city tier classification system can be adapted to SITEE so as to broaden and maximize the results and the impacts that can be obtained for one city, leading to the identification of a group of solutions that can be a valid option for all the cities belonging to the same tier.

A comprehensive summary of the analysis and a deep dive on conclusions and insights of the first SITEE application is provided in the final chapter of this article.

2. A New Methodology for Estimating the Replication Potential

2.1. Introducing SITEE

According to the literature, the concept of replication embodies many shades of meaning and it is arduous to find one single definition.

An extensive study published by DG ENERGY (EC DG ENERGY 2016), Directorate-General for Energy of the European Commission, connects the notion of replicability to the possibility of applying the same solution/technology implemented in a city to a different context with the aim to achieve the same objective. It states that replicability may address both:

- Scale: the extent to which a solution can adapt to the different configurations of the environment.
- Context: whether the solution can be replicated in a different environment.

More generally, replication can be defined as the application of a successful model, approach, strategy, technology, product or communication tool at the same or another location. In this regard, it is important to specify that “application” is not intended as the exact copy of the same product/solution in other contexts, but should rather be understood as an adaptation of the product/solution to a different environment or the simple inspiration in terms of ideas which lead to a different solution through the same process. Thus, it is worth identifying both the replication potential of a product/solution as such as well as those drivers of replicability that are context-dependent.

Another important point is that assessing the replication potential of urban solutions is complex, and an exclusive focus on technical aspects is not sufficient to guarantee the effectiveness of replication. It is for these reasons that, beyond the technological dimension, the socio-cultural side, as well as environmental, legal, institutional and economic aspects must be taken into account.

In other words, there is no single element that represents more than others an obstacle or an enabler to the roll-out of solutions, but it is the combined effect of all these dimensions that limits or facilitates the possibility for a project to be successfully implemented at a higher scale or in other contexts (EC DG ENERGY 2016).

In view of all this, the SITEE replicability method seeks to determine the replication potential of urban solutions in a specific context, taking into account, any local factor that could influence their applicability with the ambition to support cities in the selection of the most suitable solutions. Therefore, SITEE is based on the analysis of 5 specific dimensions:

- Socio-cultural;
- Institutional;

- Technological;
- Environmental and
- Economic.

SITEE considers the specific factors that intrinsically characterize the solution under assessment as well as the local factors relevant for the context where the solution is supposed to be replicated. Data on local context should be obtained through questionnaires addressed to institutions, stakeholders, citizens from the city targeted for replication, while specific information on the solutions should be elicited from the industrial/private entities who implemented the solutions or, alternatively, can be obtained through desk research activities and experts' estimations.

Thus, in SITEE, every dimension is associated to specific solution and context variables, listed in Table 1 below and described in-depth in the following.

Table 1. Solution and context variables in socio-cultural, institutional, technological, environmental and economic (SITEE).

SITEE Dimension	Solution Variables	Context Variables
Socio-Cultural	User interaction independence	<ul style="list-style-type: none"> • Population acceptance • Responsiveness to population needs
Institutional	Public-private cooperation	<ul style="list-style-type: none"> • Responsiveness to institutional priorities • Responsiveness to institutional needs
Technological	<ul style="list-style-type: none"> • TRL ¹ (or SRL ²) • Interoperability/standardization level 	<ul style="list-style-type: none"> • Interest from research/industry/private sectors to invest • Integrability in the existing infrastructure (hardware/software)
Environmental	CO ₂ eq reduction	Legal viability
Economic	<ul style="list-style-type: none"> • Investment costs • Operation costs • Revenues (or savings) 	<ul style="list-style-type: none"> • Weighted average cost of capital of the city

¹ Technology readiness level. ² Solution readiness level.

Before going through the rationale behind the method, an overview of the expected outcomes is fundamental and helpful to clearly understand the ambition and the wide application potential. The following figures (Table 2 and Figure 1) give a first comprehensive overview of how SITEE works.

Table 2. SITEE expected results—overall replicability potential. Source: Table by author.

	Socio-Cultural Replication	Institutional Replication	Technological Replication	Environmental Replication	Economic Replication	Overall Replication Potential
Solution 1	?	?	?	?	?	?
Solution 2	?	?	?	?	?	?
Solution 3	?	?	?	?	?	?
Solution 4	?	?	?	?	?	?
Solution 5	?	?	?	?	?	?
Solution 6	?	?	?	?	?	?

Given a certain number of urban solutions, the method calculates the corresponding replication potential (%) for every single dimension (Table 2). The five values obtained are then averaged² to get the overall replication potential of that given solution in the specific context (e.g., city, district, etc.) under assessment, leading to a ranking from the most to the least replicable solutions (Figure 1).

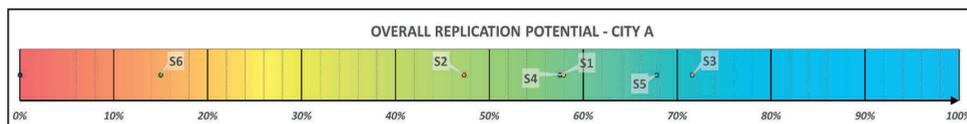


Figure 1. Solutions ranking. Source: Figure by author.

In this way, cities are supported in the selection and identification of those urban solutions that could be best replicated according to the socio-cultural, institutional, technological, environmental and economic factors proper of their local context.

2.2. The Approach

Replicability is, thus, the result of specific assumptions and intricate correlations among several dimensions and numerous variables.

The mathematical approach adopted in SITEE makes it possible to break down this complex analysis into multiple elements that can be easily understood and graphically displayed through cartesian diagrams whose variables are dependent both on specific factors proper of the solution (horizontal axis) and on local factors

² Simple or weighted average.

relevant for the context (vertical axis). Accordingly, every solution can be represented as a point in the diagram (Figure 2a).

To establish a correlation between solution variables, context variables and replicability potential, a third axis is introduced (Figure 2b). The intersection between the points representing the solutions and the iso-replicability lines (diagonal lines in Figure 2b) determines their replication potential, expressed on a scale 0–100%.

This approach is likewise applied for every SITEE dimension.

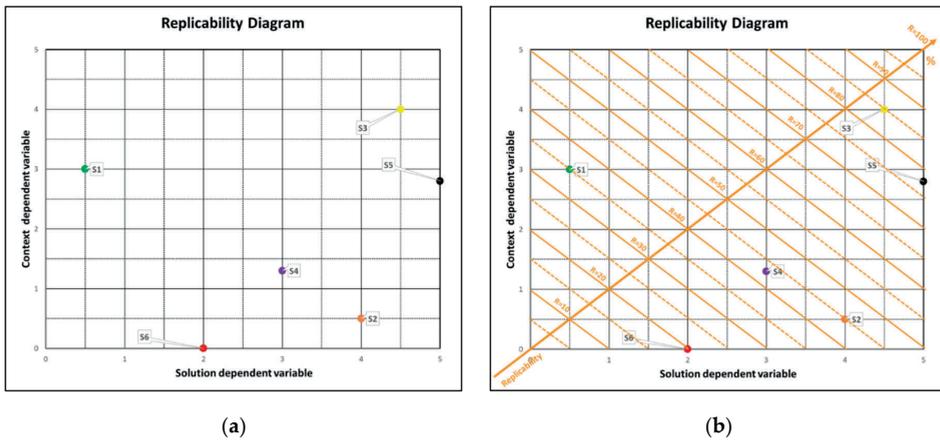


Figure 2. Replicability diagrams: (a) context–solution; (b) context–solution–replicability.
Source: Figure by author.

2.3. The Sample

For the sake of simplification, six urban solutions have been chosen in order to conveniently illustrate the basic functioning of the method (Table 3)³; therefore, the quantitative figures considered in the following are just fictitious numbers used for explicative purposes.

³ All these urban solutions are just general examples, with no direct reference to social integration or specific relevance for the EU–China analysis that will be carried out. The only purpose is to facilitate the comprehension of the approach. In the test phase, the analysed measures have been selected according to their relevance for social integration and inclusiveness.

Table 3. Urban solutions.

Code	Solution	Notes
S1	Bike Sharing	Station based bike sharing system
S2	District Heating	Combined Heat and Power + District Heating Infrastructure
S3	Efficient Lighting	Substitution of high-pressure sodium-vapour lamps with high performance LED lamps in the public lighting system.
S4	E-Mobility Infrastructure	Electric charging stations for E-vehicles
S5	3D City Platform	3D city models are digital models representing different urban areas. They support presentation, exploration, analysis, and management tasks in a large number of different application domains. In particular, 3D city models allow “for visually integrating heterogeneous geoinformation within a single framework and, therefore, create and manage complex urban information spaces.” (Döllner et al. 2006)
S6	Automated Vehicles	This solution is taken as example of innovative products not yet market-ready.

2.4. Socio-Cultural Replicability

The socio-cultural replicability is assumed to be dependent on the degree of interaction with citizens, that are intended as the final users and beneficiaries of the solution (EC DG ENERGY 2016). A solution that does not require any active role from the population is more likely not to encounter any cultural roll-out barriers. In other words, the higher the level of interaction required, the higher the chance of facing risks in the replication of the solution.

Moreover, the social acceptance of the solution as well as the extent to which it responds to the population needs represent two important factors affecting replicability.

According to these assumptions, the socio-cultural replicability diagram depends on the following variables (see Figure 3):

- *User interaction independence (horizontal axis)*: It is an intrinsic characteristic of the solution and does not vary if the context changes. This indicator can assume values from 0, active involvement of the users, to 5, passive involvement. The more the solution requires active participation of the users to work, the higher is the risk that it would not work as expected and, consequently, the lower is the replication potential.

- Population acceptance and needs (vertical axis): This variable takes into consideration both the degree of acceptance of the solution as well as the extent to which it is needed by the population of the specific city under assessment. The higher the “needs” and “acceptance” levels, the higher the socio-cultural replication potential is.

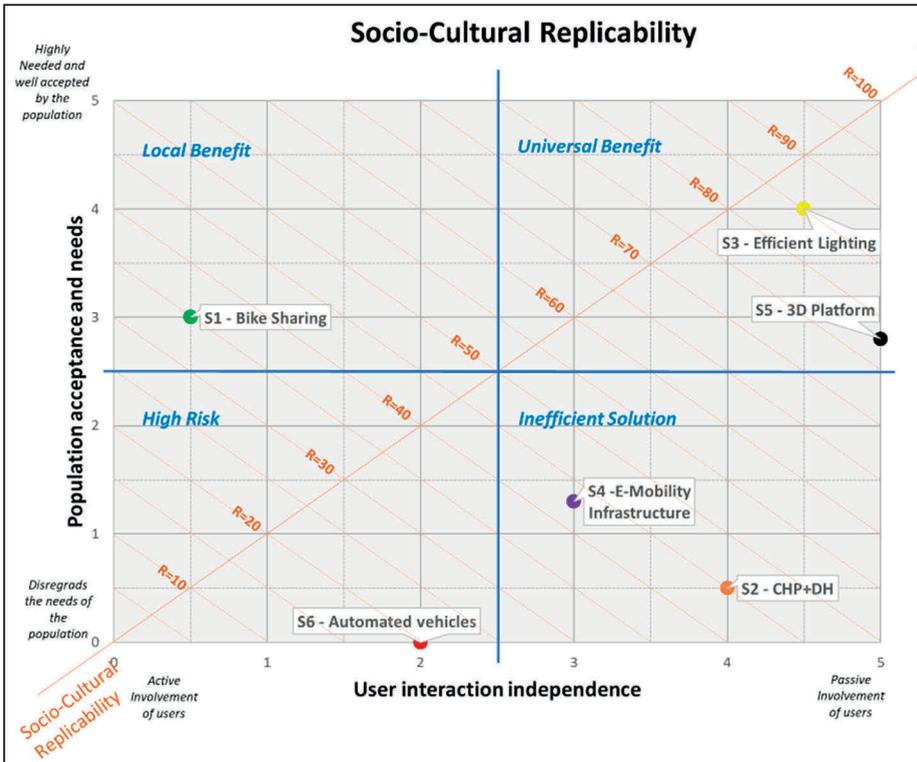


Figure 3. Socio-cultural replicability. Source: Figure by author.

The examples reported in Figure 3 clearly reflect this rationale: it is evident that bike sharing requires active involvement of citizens, notably people should use the service so that it works. For these reasons, the horizontal value is low ($x = 0.5$). On the other hand, efficient lighting can be considered a passive solution as it is completely independent from the interaction of citizens ($x = 4.5$). In this example, vertical values are randomly assigned as they may vary city by city (see Table 4—Y-axis).

With all these assumptions, it is thus possible to calculate the socio-cultural replicability of the solutions taken into exam (Table 4).

The results in Table 4 show how efficient lighting is the solution with the highest socio-cultural replicability potential, while automated vehicles present the

lowest values since they are not needed nor well accepted by the population of the hypothetical city considered in this example (low *y*-values) and, as in the case of bike sharing, would require people choosing this mean of transport (low *x*-value).

Table 4. Socio-cultural replicability: inputs and results. Source: Author’s estimations for testing the tool.

Solution	X-Axis	Y-Axis			Socio-Cultural Replicability
	Users Interaction Independence	Acceptance	Needs	Average	
Bike Sharing	0.5	2.0	4.0	3.0	35%
District Heating	4.0	1.0	0.0	0.5	45%
Efficient Lighting	4.5	5.0	3.0	4.0	85%
E-Mobility Infrastructure	3.0	2.0	0.5	1.3	43%
3D City Platform	5.0	5.0	0.5	2.8	78%
Automated Vehicles	2.0	0.0	0.0	0.0	20%

As can be seen, it is already possible to rank solutions from the most to the least replicable, but it is necessary to take into account the other four dimensions before drawing general conclusions. However, from these partial results, it is possible to get a first idea on the socio-cultural context and on the potential barriers and/or enablers to the roll-out of the solutions addressed. The same analysis can be done for each of the SITEE dimensions.

2.5. Institutional Replicability

The institutional dimension encompasses all those aspects related to the administrative and regulatory framework, also taking into account any political priority that can stem, for example, from a medium–long-term city strategy. These aspects must not be confused with financial support from public resources, which is equally important but not the objective of this specific analysis. Therefore, along with a favourable socio-cultural framework, a supportive institutional context is a crucial driver that cannot be overlooked in order to ensure the successful implementation of a solution. Additionally, the deployment of urban solutions, especially if complex, requires a firmer engagement of both public and private sectors. The more this cooperation takes place, the more replication is likely to be successful.

The assessment of the potential institutional replicability is therefore carried out according to the following variables (Figure 4):

- *Public and private cooperation (horizontal axis):* values range from 0, public or private driven solution, to 5, public private partnership.

- *Responsiveness to institutional priorities (vertical axis):* where high values means that the solution is highly needed by the administration and is considered among the top political priorities for the local institutions.

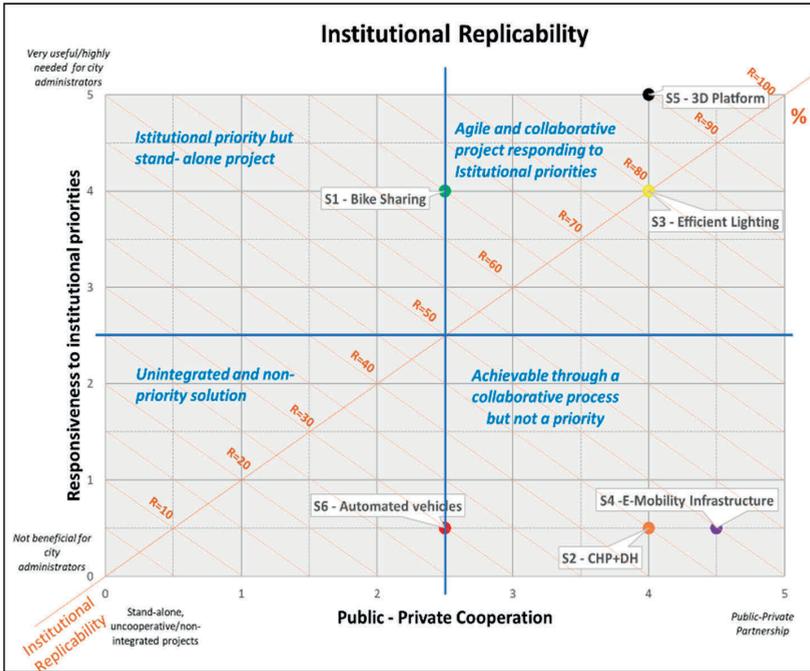


Figure 4. Institutional replicability. Source: Figure by author.

2.6. Technological Replicability

From the technical point of view, one of the limiting factors for the large-scale deployment of a device is related to interoperability issues. Interoperability is defined as “the ability of a system to work with other systems by providing services to and accepting services from other systems and to use the services so exchanged to enable them to operate effectively together” (ISO/TS 37151). This concept applies both to the technology behind the solution itself as well as to the context, which should be prepared to “receive” the solution.

However, as previously mentioned, the technological challenge is hardly ever the main barrier for the replication of an urban solution. This is even more true when the presence of a “city ecosystem” able to facilitate the deployment of projects that have been successful in another location is deeply rooted. In other terms, when industry, academia, institutional players, private businesses, etc., collaborate and act as interfaces between the projects and the social, institutional, environmental and

economic contexts, they significantly contribute to the creation of the right conditions to effectively introduce, kickstart and foster the development of a specific technology.

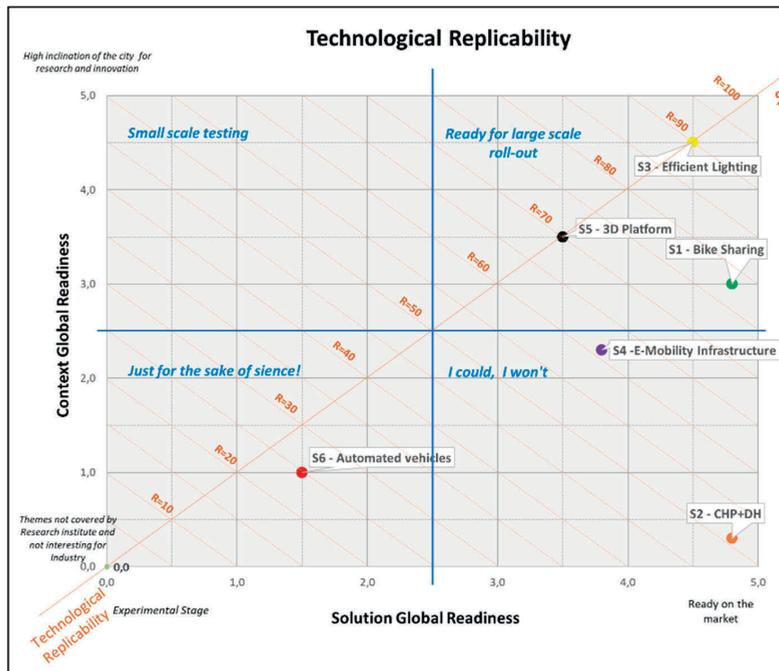


Figure 5. Technological replicability. Source: Figure by author.

Within SITEE, a broader definition of interoperability is adopted, also taking into account the research, industry and private sector communities and their interest in developing, producing and promoting a technology.

Therefore, technological replicability depends on (Figure 5):

- *Solution global readiness (horizontal axis):* it is obtained through the combination of the TRL of the technology and an estimation of the interoperability/standardization level of the solution.
- *Context global readiness (vertical axis):* this variable includes both the level of interests from research, industry, public and/or private sectors to invest in the technology and an estimation of the level of integrability of the solution with the existing urban infrastructure and technological background.

The higher the readiness levels of both solution and context, the higher the potential for technological replicability.

2.7. Environmental Replicability

Environmental variables often play an important role in this type of projects and constitute a crucial factor that influences decisions and might determine the choice of one solution over another. Thus, comparing the environmental impacts of several (even similar) solutions can have great leverage on potential replication and contributes to facilitate the prioritization process.

Environmental impacts aside, the legal constraints that a city is bound to respect must also be considered along with any other constraint that may hinder the implementation of a solution in a specific area of the city or limit its use cases in compliance with the local laws and regulations in force.

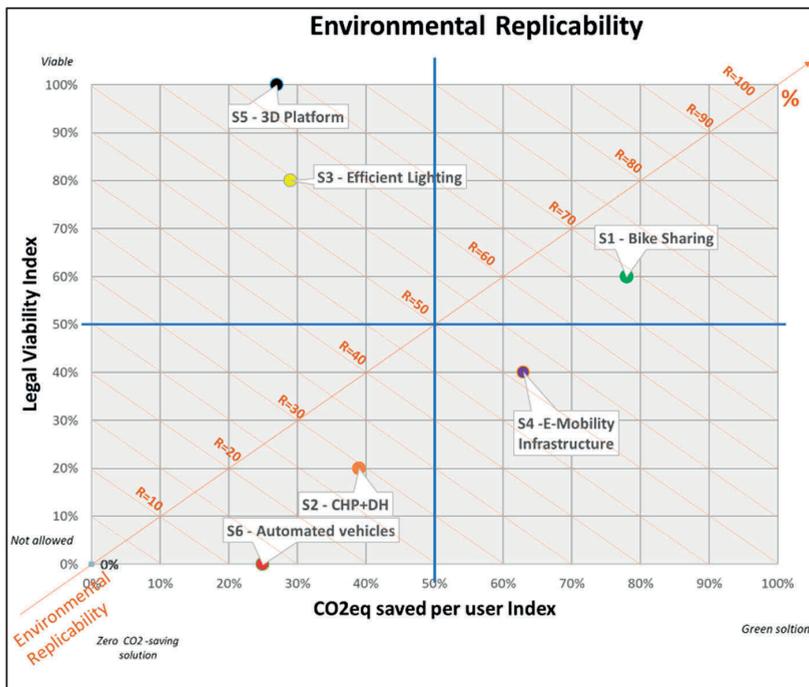


Figure 6. Environmental replicability. Source: Figure by author.

Taking both these aspects into consideration, while thinking of the potential replicability of a solution, is fundamental. It is for these reasons that the concept of environmental replicability gains an important meaning which is addressed in SITEE through the following variables (Figure 6):

- *CO₂eq saved per user index (horizontal axis)*: absolute values are adjusted on a 0–100% scale as the calculation of replicability potential works only with ranges whose upper and lower limits are defined. Higher values correspond to greener solutions.⁴
- *Legal viability (vertical axis)*: this value is the result of a qualitative estimation of the efforts required for obtaining the permit or the license for implementing a solution. This value ranges from 0, if the solution is not legally viable or can be implemented only after a very time-consuming process and big efforts so that it does not violate any legal constraint, to 5, which means that the solution is viable and minimum efforts are necessary to obtain the permits.⁵

Environmental replication is higher when emissions saved are large and legal constraints are limited.

2.8. Economic Replicability

There is no need to emphasize how economic aspects are key and decisive elements for the selection of the best solutions to replicate, especially for the city administration interests as well as from the major industry players and private investor perspectives.

A project with a positive business model that, concurrently, does not entail major obstacles from the legal and technological point of view and, in addition, brings environmental benefits while responding to the main needs of the population and institutions, is undoubtedly the perfect example of a solution to be replicated.

SITEE's economic analysis is based on the net present value (NPV) method which is a valid tool for the assessment of the profitability of projected investments. It must be made clear that SITEE is not designed to carry out a detailed cost benefit analysis, as it rather aims at providing a credible estimate of the economic worthiness of the individual solutions. A specific and targeted study is therefore necessary to evaluate the cost-effectiveness case by case.

Thus, the economic replicability diagram is built on the following parameters (Figure 7):

- *Internal rate of return (IRR) index (horizontal axis)*: the internal rate of return is the rate of growth a project is expected to generate.⁶ A project with a substantially

⁴ CO₂eq is a valid but not exhaustive environmental indicator, so the possibility of including other environmental variables such as noise, air quality, etc., is currently in the process of assessment for the next improved version of SITEE.

⁵ These values are then adjusted on a scale 0–100% in order to be compliant with the requirements of the diagram.

⁶ Values are adjusted on a scale 0–100%, where 100% is the highest IRR calculated in the sample (rounded upward). In this way, the economic replicability potential is a relative value. This means it could change whether the package of solutions changes.

higher IRR value than other available options would provide a much better chance of strong growth. (Hayes 2020) (Ross 2020);

- *NPV/CAPEX⁷ index (vertical axis):* this variable takes into account the net present value of the solution in relation with the initial investment costs to be incurred. This is an expedient made to ensure comparability among solutions. The context specific dimension is provided through the calculation of the weighted average cost of capital (WACC) that is included in NPV formula and is different city by city.⁸

Economic replicability is directly proportional to IRR and NPV.⁹

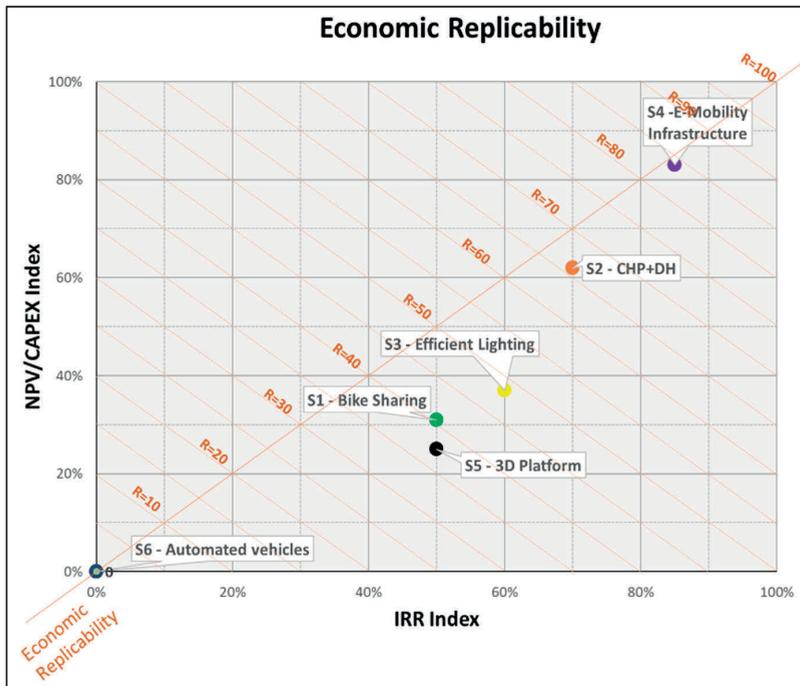


Figure 7. Economic Replicability. Source: Figure by author.

⁷ Capital Expenditure.

⁸ WACC is the average return rate that a company needs to earn to compensate its security holders or investors. This calculation is used to measure if a project is profitable or if it just compensates the cost of funding the project (Hargrave 2020).

⁹ For equal cash flows, these two variables are not dependent on each other.

3. The Case Study in Wuhan

Within the project TRANS-URBAN-EU-CHINA, a team of experts from ISINNOVA had the opportunity to test the methodology.¹⁰ The city of Wuhan was selected among the Urban Living Labs involved in the project and the Chinese partner Chinese Academy of Sciences (CAS) contributed as local reference and contact point of the city.¹¹

The scope of the work was to estimate the replication potential of a set of European Urban Solutions in the city of Wuhan.

The results of this test have been relevant for the validation of the method and for the identification of areas for further improvement of the whole process with the ambition to build a solid and robust approach for estimating replicability that could be extended to other cities.

Testing activities carried out in this experimentation provided for:

- identification of criteria for selection of urban solutions;
- selection of urban solutions;
- calculation of the solution variables required;
- preparation and distribution of the questionnaire for collecting the context variables;
- running of the tool;
- elaboration and analysis of results with a focus on Chinese context.

3.1. Short Description of the Selected European Urban Solutions

After a dedicated selection process, which kept into account different criteria including several characteristics of social integrative cities (Müller et al. 2019) and some priority areas identified by the city of Wuhan (Aune et al. 2018)—see Figure 8—nine European eco-smart urban solutions have been selected from a rich database of more than a hundred (Table 5).

¹⁰ ISINNOVA, is an Italian independent research institute (Website: <http://www.isinnova.org/>), partner of TRANS URBAN EU CHINA project.

¹¹ CAS is the national academy for the natural sciences of the People's Republic of China, partner of TRANS URBAN EU CHINA project.

Fields of actions to promote **social integrative and inclusive cities** (D6.6):

1. Reducing urban sprawl and promoting well-balanced land conversion from 'rural' to 'urban' and appropriate access to urban land
2. Involving the different stakeholders in collaborative and participative planning and design processes on the different politico-administrative levels
3. Improving the environment and living conditions in urban areas
4. Upgrading the physical environment in distressed areas
5. Promoting efficient and affordable urban transport
6. Assuring equal access to municipal services
7. Strengthening the local economy and labour market
8. Strengthening (technical and social) innovation in cities and neighbourhoods opening up new possibilities for the local population
9. Fostering proactive education and training policies for children and young people in disadvantaged neighbourhoods
10. Preserving cultural heritage and fostering the identity of neighbourhoods and their inhabitants
11. Fostering social capital and engagement of local stakeholders
12. Supporting adequate institutional and financial conditions and mechanisms

Priority Areas identified for the UN-HABITAT and WLSP competition (D5.2):

- A. Improving and innovating urban public spaces
- B. Revitalization of waterfront spaces
- C. Revalorizing industrial heritage
- D. Socially inclusive and compact inner-city centres
- E. Creating new tourism destinations

Figure 8. Criteria adopted for the selection. Source: Figure by author.

Table 5. Short description of the nine EU urban solutions selected.

Solution and Short Description	EU City
<p>S1—Shared Mobility Agency¹ Set up of an Agency that provides a wide range of mobility services able to comply with the needs arising from different demand segments. Integration of sustainable and more inclusive transport modes with Public Transport and reduction in the use of private vehicles. Ensuring access to different mobility services to a broader range of citizens and tourists.</p>	Elba (Italy)
<p>S2—Public e-bike system² Introduction of innovative biking systems and green vehicles, also accessible for the physically impaired. Provision of an integrated smart card and information on service available through digital kiosks and a Mobility App. This measure ensures equal access to e-bike services for all citizens categories, taking into account also the needs of physically impaired people, thereby fostering social inclusiveness.</p>	Las Palmas (Spain)

Table 5. *Cont.*

<p>S3—Citizen PV Power Plant³ A simple, profitable and secure option for interested people to participate in renewable energy development. Main concept: to sell solar panels to those citizens unable to install them due to their lack of rooftop space and let the electric company plan, build and operate the solar power facilities. Consumers operate as an energy provider, with a profitable business model, selling energy to the grid and earning revenues. Fostering social capital investments and engagement of local stakeholders, supporting social integrative and inclusive concepts.</p>	<p>Vienna (Austria)</p>
<p>S4—Green credits scheme⁴ Encourage citizens to adopt more sustainable lifestyle patterns by providing tangible economic rewards. Public transport users will accumulate points as rewards for using sustainable modes of transport. These points can be monetized to purchase products and services in several places: shops, museums, theatres, etc. This scheme will substantially contribute to the reduction of greenhouse gas emissions while strengthening the local economy and labour market.</p>	<p>Las Palmas (Spain)</p>
<p>S5—BigBelly⁵ Innovative approach to waste collection. It deploys smart, solar-powered, sensor-equipped waste and recycling stations that communicate real-time status to collection crews to enable efficiencies. Each unit communicates its real-time status and notifies crews when it is ready to be collected. This streamlines waste management operations, increases productivity, and keeps public areas clean and green. Improved living conditions in urban areas: this smart waste system eases logistics, declutters the streetscapes, and further enhances the community experience with improved services.</p>	<p>Dún Laoghaire County⁶ (Ireland)</p>
<p>S6—Used Cooking Oil (UCO) in urban waste collection truck⁷ Integration of the full Used Cooking Oil (UCO) to biodiesel chain. Expansion and improvement of the UCO collection system: new collection points are introduced involving smart sensors at UCO collection containers, monitored through a web-based platform. A platform allows real-time monitoring of the oil filling level, optimisation of the collector’s routes, and provides alerts for unauthorized incidents (e.g., theft, vandalism, reallocation of containers). This pilot experiment represents an opportunity to strengthen technical and social innovation in the island, opening up new possibilities for the local population (increase employment, establish a local-based fuel supply chain).</p>	<p>Rethymno (Greece)</p>

Table 5. *Cont.*

<p>S7—Green Label Award⁸ Green Label is awarded to hotels that commit to encourage the use of sustainable mobility modes by their guests, offer sustainable mobility promotional material in their lobby, provide cooking oil for recycling as bio-diesel, offer bike rentals at hotel, promote the sustainable mobility application and require their front office employees to participate in sustainable mobility training sessions. A Tourist Mobility Card is combined with this initiative to enable visitors and residents to buy one single ticket for the duration of their stay, for all their PT transfers. This measure leads to a more inclusive, collaborative and open community of citizens and local stakeholders supporting green and cultural initiatives in the city.</p>	<p>Limassol (Cyprus)</p>
<p>S8—Cold Ironing⁹ Cold Ironing is the process of providing shoreside electrical power to a ship at berth, while its main and auxiliary engines are turned off. Thanks to this technology, significant emissions reductions have been achieved: Antwerp Port cut CO₂ emissions by more than half and NO_x emissions by 97%, while CO emissions are practically eliminated. Refurbishing of port and industrial areas is an opportunity for boosting local economy and foster sustainable transport of goods and people.</p>	<p>Antwerp (Belgium)</p>
<p>S9—E-buses¹⁰ The first European all-electric bus garage, hosting a fleet of fully electric buses. In comparison to the replaced diesel buses, these high capacity single decker vehicles are more efficient by 700 tonnes of CO₂ per year and have improved London’s air quality since their introduction. This solution guarantees sustainable transport modes for citizens and tourists.</p>	<p>London (UK)</p>
<p>¹ (Ambrosino 2018); ² (Sitycleta 2020); ³ (Energy Cities 2020); ⁴ (Civitas 2020a); ⁵ (BigBelly 2020a); ⁶ Case study in Ireland here: (BigBelly 2020b); ⁷ (Destinations Platform 2020); ⁸ (Civitas 2020b); ⁹ (AJOT 2019); ¹⁰ (Go_Ahead 2020).</p>	

3.2. Results and Analysis

Following the selection process, the work proceeded with the research and collection of the data needed to operate the tool. Therefore, desk research activities were carried out by ISINNOVA to calculate the Solution Variables. In parallel, questionnaires and detailed documentation material on the solutions were distributed to CAS in order to obtain the information necessary to quantify the Context Variables for the city of Wuhan.

This work led to the ranking shown in Table 6 below (see also details and graphical representations in Figures 9 and 10).

Table 6. Ranking of solutions. Source: Data from SITEE tool.

Rank	Code	Solution	Replication Priority Index
1	S2	Public E-bike System	93%
2	S4	Green Credits Scheme	71%
	S5	BigBelly	71%
3	S9	E-buses	37%
4	S3	Citizen PV Power Plant	26%
5	S8	Cold Ironing	17%
6	S1	Shared Mobility Agency	16%
7	S6	UCO in Urban Waste Collection Truck	7%
8	S7	Green Label Award	2%



Figure 9. European Urban Solutions ranked according to their Replication Potential in Wuhan. Source: Figure by author—SITEE tool.

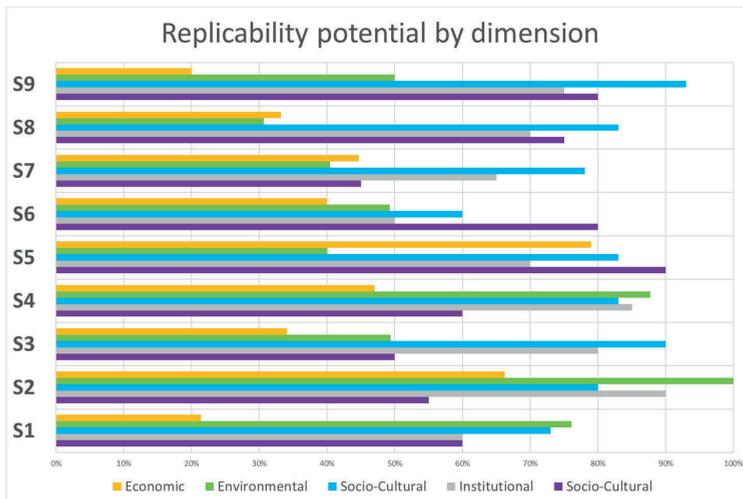


Figure 10. Replicability potential by dimension—Wuhan. Source: Figure by author—SITEE tool.

The factors behind these results are multiple and a thorough “dimensional” analysis has been carried out for each solution, with the purpose of identifying the main drivers that affect the correct and successful implementation while pinpointing the potential barriers.

A short summary of this assessment is provided hereafter for some of the solutions, while the full analysis report can be found in Deliverable 2.3 of TRANS-URBAN-EU-CHINA project (Neumann et al. 2020).

3.3. Summary of Results

In Wuhan, sustainable mobility solutions such as the Public E-bike System (S2) and the Green Credit Scheme (S4) turned out to be the most replicable as they would be grounded in a local context ready to welcome them easily both in terms of existing infrastructures, able to embed such technologies without major difficulties, and from the social acceptance point of view, as they fully meet the needs of citizens and contribute to improving the environment and the quality of their lives. In particular, according to the responses received by CAS, it was confirmed that Wuhan municipality aims to introduce eco-friendly behaviours, to raise awareness and to create affordable and sustainable incentive instruments in support of initiatives similar to the Green Credit Scheme, which could also lead to an increase in the city attractiveness for tourists.

Furthermore, making waste collection and management processes more efficient is another solution that could prove successful in Wuhan. It must be said that BigBelly system (S5) is widely spread in many cities across the world, with well-established interoperable standards that make it highly replicable regardless of the specificities of the different urban contexts. In this regard, Wuhan has already adopted a standardized system as required in other big cities in China and, recently, began to encourage collecting waste by categories in order to facilitate recycling and lower the negative impact on the environment. This solution is perfectly aligned with the current situation, because the COVID-19 residents are showing higher acceptance of measures that further improve city’s environment, including innovative waste collection systems such as timely collection of medical waste from hospitals by volunteers.

It is also important to note that, although the “UCO in waste collection trucks” and the “Green Label Award” may have interesting traits that make them rather suitable for Wuhan,¹² the comparison with the other solutions makes them less adequate, albeit, with the necessary precautions, not entirely impossible to implement

¹² i.e., responsiveness to population’s needs (S6 and S7), attractive technology for the industry and private sectors that would be willing to invest, etc.

nor totally to be ruled out. After all, it must be considered that the objective of this specific analysis was to identify the most replicable options starting from a portfolio of solutions that featured aspects of interest for the city of Wuhan at the outset.

Finally, it must be stressed again that the Context variables provided by the city of Wuhan were suitably combined with the intrinsic variables of the solutions analysed, therefore the final replicability value takes into account a wide variety of aspects that can strongly influence and even lead to surprising final results partially in contrast with the initial expectations of the city—as shown in Figure 11, below where, in the Context Ranking graph obtained from the questionnaire, the initial score is different from the final prioritization.

It all goes to prove how important it is that the replication analysis considers both solution- and context-specific variables in combination, making sure that the analysis is complete and reliable.

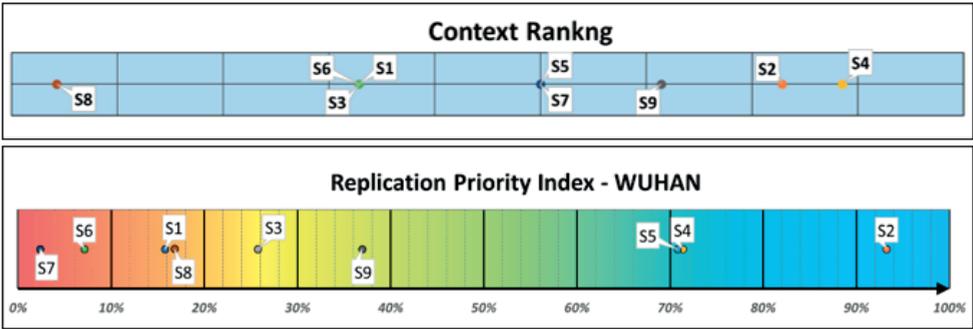


Figure 11. Context ranking and replication ranking—comparison. Source: Figure by author- SITEE tool.

4. Key Findings and Conclusions

The analysis carried out provides a good basis for drawing general conclusions both on the method itself and on potential further applications in China.

A first important conclusion is that SITEE is not only a means of prioritization of urban measures in support of decision-making process but can provide valid suggestions for improvement whenever weaknesses, that could hinder the application of potentially winning solutions, are found in the local context.

Furthermore, the application of this methodology is well suited to the comparison between cities, as crucial aspects for replication can emerge more clearly from comparative assessments.

Figure 12 shows the diverse functionalities of SITEE. As “prioritization” and “dimensional analysis” were extensively explored in the previous chapters, a relevant description is provided for the remaining functionalities in the next paragraphs.



Figure 12. SITEE functionalities. Source: Figure by author.

4.1. Gap Analysis

Beyond the dimensional analysis and its function of prioritization, SITEE is also a useful tool to detect potential gaps in the implementation of measures and could support the identification of further actions to improve and strengthen the city in areas where it is weaker so as to make it ready to take on new challenges and implement more and more innovative measures. For example, understanding the reasons for a low social acceptance of a measure could inspire the implementation of accompanying measures aimed at raising awareness, communicating and involving potential users (e.g., Green Label Awards, Public E-bike system, etc.). Or, in the case of low economic replicability, national/local financial support schemes could be envisaged for industries and companies willing to invest in research for a specific technology (e.g., UCO in urban waste trucks); or when facing bureaucracy delays in obtaining the permits, procedures could be reviewed and converted in smarter and faster processes in order to facilitate implementation as much as possible (e.g., Citizens Power Plant). Likewise, many other corrective actions could be suggested following the replicability analysis.

4.2. City Comparison

The limited scope of this test did not allow comparisons with other Chinese cities to be performed. However, it would be worthwhile and interesting to see how the assessment of the same group of solutions could lead to different results in other Chinese cities with diverse characteristics compared to Wuhan. This is possible and can be easily done in SITEE by varying the values of the context variables obtained from other Chinese cities, while keeping the solution variables unchanged.

4.3. Potential Future Application in China

The application of SITEE to the Chinese context might have interesting implications.

With its near-continental size, China is a country that is not easy to approach, especially because of the heterogeneity that characterizes it in many aspects, areas and sectors. Due to this complexity, Chinese cities are typically grouped into four tiers.

Traditionally, Tier 1 cities are the largest and wealthiest—often considered the megalopolis of China. As the tiers progress, the cities decrease in size, affluence, and move further away from prime locations. This means also that cities belonging to Tier 1 are directly controlled by the central government while Tier 4 cities have greater autonomy as they are county level cities.

This categorization can be adapted to SITEE so as to broaden and maximize the results and the impacts that can be obtained for one city, leading to the identification of a group of solutions that can be a valid option for all the cities belonging to the same tier.

In addition, the criteria used in the tiers classification offer an interesting starting point in the assignment of weights to the five dimensions of SITEE, not considered in this test. For example, since Tier 4 cities have a greater political autonomy, a higher weight could be assigned to the Institutional Dimension; on the other hand, the technological dimension in Tier 1 cities could be higher as they are more advanced and often host universities, important research centres and industries headquarters.

Currently another cluster classification is under development in China: the City Cluster Plan aims at creating key areas for Chinese urbanization in which cities may play different roles according to their respective positioning in the region.

In this regard, SITEE approach may help urban planners and decision makers to well identify the comparative and competitive advantages of each city in each cluster region from a multi-dimensional perspective (Wong 2019; Xing 2017).

4.4. Connecting Cities

Furthermore, SITEE could prove useful to connect with other European and non-Chinese cities and lead to the identification of similarities in view of possible twinning, opening a dialogue and discussing potential collaborations on issues related to sustainability and social integration. This exchange of knowledge and experiences is a fundamental step in the replication process and in the case of Wuhan, for example, the fact that two of the most replicable solutions have been implemented in the city of Las Palmas could offer ideas and inspiration on a potential twinning and lead to decisions that had never been considered before.

4.5. Upscaling and Areas for Further Improvements

The analysis was mainly focused on replicability. As for scalability, SITEE does not foresee a specific application but further developments are planned in that sense and could be made by adapting the multidimensional approach of SITEE to small-scale solutions to be upscaled to a wider area in the same city. Nevertheless, the high value of overall replicability along with positive scores in the economic dimension could allegedly enable the identification of highly scalable solutions.

Another potential improvement that will be implemented in SITEE relates to the Environmental dimension. Currently, only CO₂_{eq} emissions reduction data are processed in the tool and the possibility to integrate other relevant variables, like air-quality and noise, is under assessment.

Finally, it should be stressed that SITEE is a very versatile method which, thanks to its modular nature, allows for additional adaptations and extensions to other dimensions whenever necessary. In this regard, future investigations on how to add the health dimension will be done, and the provision of further specific metrics to better address social inclusive and integrative measures will be incorporated.

Funding: This research received no external funding.

Conflicts of Interest: The author declares no conflict of interest.

References

- AJOT. 2019. Cold Ironing. Available online: <https://www.ajot.com/news/cold-ironing-project-port-of-antwerp-and-independent-container-line> (accessed on 1 April 2020).
- Ambrosino, Giorgio. 2018. EU Civitas Destinations Project—Shared Use Mobility Agency in Elba Island: from the Concept to the IT Platform. CIVITAS DESTINATIONS Project. Available online: https://civitas.eu/sites/default/files/shared-use-mobility-agency_booklet.pdf (accessed on 1 April 2020).
- Aune, Pål, Yu Wang, Annemie Wyckmans, Jinjing Zhang, Yue Liu, Chang Liu, Jianming Cai, and Johannes Riegler. 2018. Report on the Living Lab Knowledge Base. Deliverable of TRANS-URBAN-EU-CHINA Project. Available online: https://eurocities.eu/wp-content/uploads/2020/08/TUEC_Living_Lab_knowledge_base.pdf (accessed on 1 November 2019).
- BigBelly. 2020a. Available online: <https://bigbelly.com/platform/> (accessed on 1 April 2020).
- BigBelly. 2020b. Case study in Ireland. Available online: <http://info.bigbelly.com/case-study/dun-laoghaire-rathdown-county-council?hsCtaTracking=8e04005a-2b28-4761-aa4b-721a0dbd41ed%7C34fe00c4-dee1-41cc-a581-628155d05310> (accessed on 1 April 2020).
- Civitas. 2020a. Green Credits Scheme. Available online: <https://civitas.eu/hr/measure/green-credits-scheme> (accessed on 1 April 2020).
- Civitas. 2020b. Green Label Award. Available online: <https://civitas.eu/measure/green-label-award-tourist-mobility-car> (accessed on 1 April 2020).

- Destinations Platform. 2020. Used Cooking Oil (UCO) in Urban Waste Collection Truck. Available online: <https://www.destinationsplatform.eu/news/UCONews.htm> (accessed on 1 April 2020).
- Döllner, Jürgen, Konstantin Baumann, and Henrik Buchholz. 2006. Virtual 3D City Models as Foundation of Complex Urban Information Spaces. In *11th international Conference on Urban Planning and Spatial Development in the Information Society (REAL CORP)*. Edited by Manfred Schrenk. CORP—Competence Center of Urban and Regional Planning: pp. 107–11. Available online: https://www.corp.at/archive/CORP2006_DOELLNER.pdf (accessed on 1 November 2020).
- EC DG ENERGY. 2016. Analysing the Potential for Widescale Roll Out of Integrated Smart Cities and Communities Solutions. Available online: https://ec.europa.eu/energy/sites/ener/files/documents/d2_final_report_v3.0_no_annex_iv.pdf (accessed on 1 May 2019).
- Energy Cities. 2020. Citizen PV Power Plant. Available online: <https://energy-cities.eu/best-practice/citizens-solar-power-plant/> (accessed on 1 April 2020).
- García-Fuentes, Miguel Á., Ana Quijano, Cristina de Torre, Rubén García, Philippe Compere, Christelle Degard, and Isabel Tomé. 2017. European cities characterization as basis towards the replication of a Smart and Sustainable Urban Regeneration Model. *Energy Procedia* 111: 836–45. [CrossRef]
- Go Ahead. 2020. E-buses. Available online: <https://www.flipgorilla.com/p/25051442997888412/show#/25051442997888412/0> (accessed on 1 April 2020).
- Hargrave, Marshall. 2020. *Weighted Average Cost of Capital—WACC*. New York: Investopedia-Corporate Finance & Accounting.
- Hayes, Adam. 2020. *Internal Rate of Return—IRR*. New York: Investopedia-Corporate Finance & Accounting.
- Müller, Bernhard, Paulina Schiappacasse, Baojun Yang, and Chang Liu. 2019. Workshop Report on “Theoretical Aspects of Transition towards Urban Sustainability and the Role of Socially Integrative Cities”. Deliverable of TRANS-URBAN-EU-CHINA Project. Available online: http://transurbaneuchina.eu/fileadmin/user_upload/tuec/files/Deliverables/TRANS-URBAN-EU-CHINA_D6.6.pdf (accessed on 1 October 2019).
- Neumann, Hans-Martin, Daiva Jakuyte-Walangitang, Susanne Meyer, Gudrun Haindlmaier, and Christoph Brodник. 2020. Concept for Practical Tools and Mechanisms for the Development of Sustainable Cities, Integrative Planning and Implementation. Deliverable of TRANS-URBAN-EU-CHINA Project. Available online: http://transurbaneuchina.eu/fileadmin/user_upload/tuec/files/Deliverables/TRANS-URBAN-EU-CHINA_D%202.2_AIT_%2020190816_v%204.0%20.pdf (accessed on 1 September 2020).
- Ross, Sean. 2020. *Cost of Capital vs. Required Rate of Return: What's the Difference?* New York: Investopedia-Corporate Finance & Accounting, Available online: <https://www.investopedia.com/ask/answers/020415/what-difference-between-cost-capital-and-required-return.asp> (accessed on 1 June 2019).
- Sitycleta. 2020. Public E-Bike system. Available online: www.sitycleta.com/es/ (accessed on 14 April 2020).

- Wong. 2019. China's City-Tier Classification: How Does it Work? Hong Kong. *China Briefing*, February 27.
- Xing, Lijuan. 2017. To Judicialize the Eco-Civilization Policy in China: A Perspective of Grasslands Protection. Available online: http://law.ku.edu/sites/law.drupal.ku.edu/files/docs/law_journal/v26/12%20Xing%20-%20Eco-civilization%20Policy%20in%20China.pdf (accessed on 1 November 2019).

© 2021 by the author. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Urban Living Labs as Instruments of Open Innovation: Examples of Sino–European Cooperation

Annemie Wyckmans, Yu Wang, Marius Korsnes, Pål Aune, Yang Yu, Chang Liu, Edna Pasher, Mor Harir, Lee Sharir, Otthein Herzog, Buyang Cao, Nikolaos Kontinakis and Anthony Colclough

1. Introduction

This chapter analyses how urban living labs may be used as instruments of open innovation. The analysis is based on on-the-ground experiences with three urban living labs in China in the cities of Wuhan, Tianjin and Jingdezhen, in close interaction between local stakeholders and European and Chinese experts. These experiences were paired with desk research, local stakeholder workshops and Sino–European expert workshops in order to better understand the challenges that were identified in the urban living labs, and to explore pathways towards solving these challenges. Based on these methods, open innovation-based principles are discussed for urban living labs to function as meeting arenas to support communities' diversity, significance and connectedness, where participants can experiment with practical ideas and solutions towards a more cohesive, inclusive and sustainable every-day life.

This chapter builds on experiences from an EU-funded project TRANS-URBAN-EU-CHINA in which urban living labs represent physical locations in selected Chinese cities. TRANS-URBAN researchers involved in the project cooperate with local urban and regional authorities, developers, planners, citizens and other stakeholders. The living labs serve as testing grounds for the development and implementation of research results, created in the project to promote socially integrative cities (TRANS-URBAN-EU-CHINA 2019b).

2. Discussion of the Living Lab Case Studies as Instruments of Open Innovation

2.1. *About Open Innovation and Open Innovation 2.0*

Successful cocreation of knowledge and solutions between the public and private sectors, citizens and academia in living labs has the potential to generate social innovation, in which the stakeholders themselves help (re)shape their environment and trigger change (Moulaert 2013). Researchers can play a vital part as neutral, intermediary actors to curate this process, to activate multiple levels of stakeholders and decision makers into a sturdy long-term cooperation that tolerates political or

other staff shifts. As such, researchers can play “an entrepreneurial role” in urban living labs and society as a whole (Mazzucato 2013, p. 5).

In each of the three urban living labs, an Open Innovation 2.0 framework (Curley and Salmelin 2018) was implemented and adapted to local conditions, to frame the involvement and cocreation of the partners and key stakeholders in different sectors. Open Innovation 2.0 builds on the original open innovation framework as conceived by Chesbrough (2003). Open Innovation 2.0 promotes iterative, nonlinear innovation processes between multiple stakeholders from the public and private sectors, academia and civic society, in new and sometimes blurred roles, compared to the more linear exchange of ideas between individual companies in Chesbrough’s original framework. Ample use of brainstorming, group discussions and other collaboration techniques help the participants to align around a shared goal, despite their different backgrounds, cultures and motivations (Curley and Salmelin 2018).

All workshops were prepared through cooperation between European and Chinese partners with knowledge of the local stakeholders to ensure that the programme structure and content would be understandable and attractive for all participants. During all workshops, Chinese and European facilitators guided the participants in understanding the context of the workshops and challenges to be addressed, to interact and share information in discussions with Chinese and European peers and to interpret the responses that arose during the workshops in various settings.

During the living lab workshops performed in the three cities of this case study, the authors not only participated as knowledge experts and *curators* of the thematic content, but also tested a new role for researchers as *orchestrators* of cooperative innovation processes between the public and private sectors, civic representatives and other types of local stakeholders and international experts, thus setting up a quadruple helix open innovation setting of users, government, enterprises and technology providers (Roman et al. 2020). The role of *orchestrator*, fostering cross-fertilisation among participants, is typically emerging in quadruple helix cooperation (Curley and Salmelin 2018, p. 83) in the public sector, including universities; this type of role is able to be performed in an open, neutral manner (Mazzucato 2013).

2.2. Quadruple Helix Cooperation

A quadruple helix describes the cooperation between the public and private sectors, research and civil society in a knowledge society (Carayannis and Campbell 2009). While the *civil society* helix was originally described as media- and culture-based, with creative industries responsible for informing and engaging the public as passive recipients (Curley and Salmelin 2018), cocreation processes by and with citizens and their representatives are increasing in importance and frequency.

Cocreation is a process of shared value creation by end users and professionals (Prahalad and Ramaswamy 2004). Based on the principles of design thinking (Visser 2006), cocreation is increasingly used in urban transformation processes to promote social inclusion and develop better, more adapted solutions (Çalışkan 2012) that go beyond the scope any one organisation or type of stakeholder could achieve by itself (Curley and Salmelin 2018). A three-folded analytical framework proposed for open innovation in urban planning instructs how to ensure coinnovation in urban planning (Savini et al. 2017).

In the urban living labs, the range of stakeholders involved in the three case studies was broad, including municipal decision makers and administrators, other public institutions, citizens and citizen organisations, companies, and knowledge organisations, all with a stake in the development of the local community (TRANS-URBAN-EU-CHINA 2019b; TRANS-URBAN-EU-CHINA 2020). As organisers of the living labs, the authors clearly explained what the scope of the interaction would be, which roles the stakeholders and experts were expected to play and what kind of added value this could bring to the local area and its residents. With each individual set of local stakeholders and decision makers, an atmosphere of mutual trust and understanding was created prior to engaging them in the participatory activities of the living labs (Steen and van Bueren 2017).

2.3. Cocreated Shared Value

Overall, Arnstein (1969) categorises citizen involvement in three types of outcomes: nonparticipation, tokenism and citizen control. *Nonparticipation* methods typically aim to educate stakeholders or change their behaviours without involving them in the development of solutions or attempting to understand their real needs. *Tokenism* methods typically aim to inform or consult stakeholders unilaterally, with stakeholders having no realistic opportunity to participate in developing the solutions. *Citizen control* methods delegate more ownership to the stakeholders, either using cocreation methods and partnerships, or fully delegating responsibility for developing solutions to them.

In the urban living labs, the local stakeholders were able to obtain direct access to information as well as to contribute to creating evidence-based knowledge. Such efforts of ensuring the public participation on policy making have also been reflected in the reform of national law and regulation which makes sure that public involvement is mandatory (Ravazzi 2016). In this manner, the stakeholders contributed to collective transformation and decision processes that were based on a broad local knowledge and experience base, with solutions better adapted to local needs and priorities (Carstensen and Bason 2012). However, experience from the three case studies showed the challenge of dedicating sufficient time and resources to understanding local needs during the visits of the international experts to the living

labs. Dedicated workshops with local decision makers and stakeholders needed to balance expert-driven presentation of international best practices with data collection for the international cooperation, and, most importantly, with in-depth learning of local priorities.

A suite of analogue and digital methods and tools were created to help the organisers to create easy, understandable and rewarding cocreation formats depending on the type of outcome envisioned. These enabled the stakeholders to gain the confidence to participate in and take creative ownership of cocreation processes, to share their deep insights and experiences about local conditions, to better understand the vision of the other participants, to build key relationships with them and to identify new opportunities for cooperation.

2.4. *Virtual Community Building*

Cocreation processes between the local and international experts and stakeholders in the urban living labs helped identify and aligning interests, merge on-site local knowledge with international best practices and create new learning across geographical and cultural boundaries. In addition, they created valuable results by exposing day-to-day routines that hinder innovation, by contrasting business-as-usual practices of local and international experts and stakeholders.

One of the main challenges was for the European and Chinese experts to not be able to follow each living lab in real time, and hence it was challenging to build solid connections to the local stakeholder ecosystem. In order to remedy this and promote continuous communication, cooperation and learning between stakeholders and experts in between the on-site activities within the geographical location of the urban living lab, a virtual community was created.

A virtual *Community of Communities* platform (TRANS-URBAN-EU-CHINA 2018) was created as a tool for sharing knowledge and experiences among the participants of each urban living lab and across the living labs. The virtual platform reinforced the creation of ecosystems (Pasher et al. 2018) among the participants and promoted bottom-up knowledge shared by connecting different types of stakeholders across living labs, in English and Chinese. Stakeholder knowledge, best practices and lessons learnt were either added by the stakeholders themselves, or by the researchers that, as observers and facilitators of the living lab activities, often extracted different information than the directly engaged stakeholders.

The knowledge gained in the community of communities platform informed the content and format of future knowledge cafés and other living lab activities. To see that their contributions were actively being used engaged stakeholders with an additional incentive to interact and share their experiences.

The importance of a virtual tool such as the *Community of Communities* was confirmed during the COVID-19 pandemic, when all living lab activities acutely

needed to be shifted to virtual interaction, often from home offices. For instance, one of the Urban Living Labs (ULLs) were based in Wuhan, where the COVID-19 outbreak was detected first, and data collection activities planned there in the spring of 2020 had to be postponed and carried out digitally. Virtual communication abruptly became the main form of interaction and the cooperation between local stakeholders and international experts became a useful source of information and learning regarding socially inclusive urban environments between China and Europe.

2.5. Support by Data Science Algorithms

“Environmental quality, the quality of public spaces and the quality of life contribute to the well-being of the population. Strengthening a sense of community and fostering a sense of place as well as preserving cultural heritage shape the city’s in- and outward-bound image” (TRANS-URBAN-EU-CHINA 2019a). Therefore, a collection of data science algorithms were developed in order to determine the correlations of air pollution with transportation, industry and daily activities for all urban living labs. The results of this analysis supported evidence-based governmental decision-making with respect to transportation, industry, and air pollution.)

The results of the big data analytics of the contributing factors were presented with respect to air pollution and transport based on multiple data sources for urban living labs. Various impact factors were taken into account during the analyses: monthly and real-time air quality data and concentrations of gaseous pollutants and fine particles (AQI (Air Quality Index) measured by NO₂, O₃, SO₂, CO, PM_{2.5}, PM₁₀), derived from the platform for AQI Intelligent Management. The monthly air quality data for the urban living labs ranged from December 2013 to April 2020.

The annual transportation data ranging from 2013 to 2019 were collected from the national and local statistical yearbooks. Furthermore, the locations of industrial Points of Interest (PoIs) of construction, machinery and electronics, chemical and metallurgy, mining and factories, as well as shopping areas in the Urban Living Labs, were derived from AMap. Real-time traffic data were obtained from AMap for the same period as the real-time air quality data.

The analysis methods included big data analytics for nonconventional data and were concentrated on:

- visualisation of some data to determine the variations of real-world data over time;
- correlation analysis to determine the interdependencies between data;
- nonparametric tests to determine similarity and class membership of city-specific environmental data.

The use of the nonparametric tests allowed for the analysis of a group of cities with similar characteristics—i.e., with the same distributions of the values of public

transport construction indicators, instead of individual cities. This result led to improved analytical efficiency, as cities can be classified according to the public transport construction indicators, and only a representative of each class needs to be analysed in-depth.

In addition, deep learning neural network technologies were applied in order to develop a Back Propagation Neural Network (BPNN) model for Air Quality Index (AQI) prediction in cities. It delivered satisfactory predictions of the AQI based on a data set of road properties, traffic and weather data.

These data analyses constituted a top-down evidence-based framework for testing, monitoring, benchmarking and assessing impacts of the urban transition in China. This analytic approach was complemented by the online system platform creating a *Community of Communities* where the city residents are planned to contribute bottom-up to planned changes in the cities.

3. Three Chinese Urban Living Labs as Case Studies

In the case studies described and analysed in this chapter, living labs were initiated to enable cooperation between Chinese and European partners of the TRANS-URBAN-EU-CHINA project, as well as local decision makers and stakeholders such as urban authorities, real estate developers, public service providers and citizens. In the living labs, an attempt to cocreate new knowledge was carried out and tested in the local context to improve and mature it before dissemination to a global audience.

3.1. A Literature Study of Urban Living Lab Methodologies in China and Europe

In order to define the scope of the living labs in these case studies, a literature study was performed on Chinese and European living labs, followed by two expert workshops with Chinese and European experts to align expectations and experiences from both geographic areas and cultures.

An urban living lab is a spatial arena, or set of spatial arenas, in which stakeholders from the public and private sectors, research and civil society cooperate to develop, test and validate innovative solutions, processes and services (GUST 2017; Steen and van Bueren 2017). European living labs aiming to promote low carbon and sustainable cities and use a wide variety of targets, methods, actors and partnerships (Molinari 2011; Voytenko et al. 2016).

Urban living labs may include a wide range of topics, including social cohesion and innovation, urban governance, urban and rural renewal, cultural heritage, water management, e-participation, circular economy, mobility management and stakeholder involvement (JPI Urban Europe 2017). The cross-cutting cooperation between different types of stakeholders and sectors, embedded in a real urban environment, enables them to find solutions that are economically viable, scientifically

valid and well-adapted to the priorities and needs of the local stakeholders (Chron er et al. 2019; Voytenko et al. 2016).

The European Network of Living Labs (ENoLL), founded in 2006, features nearly 450 living labs, in which open innovation, cocreation and citizen engagement are key elements. ENoLL defines living labs as “user-centred, open innovation ecosystems based on a systematic user co-creation approach, integrating research and innovation processes in real life communities and settings” (ENoLL 2020). Similarly, the Joint Programming Initiative Urban Europe defines urban living labs as innovation for a “employing working methods to integrate people into the entire development process as users and co-creators to explore, examine, experiment, test and evaluate new ideas, scenarios, processes, systems, concepts and creative solutions in complex and everyday contexts” (JPI Urban Europe 2015). The URB@Exp (Scholl et al. 2017) and SubUrbanLab (2016) projects in Europe summarise success factors for urban living labs, including a transdisciplinary approach, participatory processes from the early phases onwards, a clear distribution of roles and responsibilities, adaptation to local conditions, and explicit mechanisms for learning and knowledge exchange both within and outside of the living lab.

In China, prominent examples include the China Housing Lab (ENoLL 2020), a living lab and dissemination and innovation centre embedded within the China Industry Technology Innovation Strategic Alliance for Housing (CITISAH). The living lab facilitates long-term partnerships between companies, research/design institutes and universities as members, employing a user-centred approach to create innovation for the housing industry. A second example is the Beijing City Lab (Beijing City Lab 2020), a cross-disciplinary research network studying the quality of living environments in Beijing to provide evidence-based decision support. While the Beijing City lab includes many of the characteristics embedded in a European living lab, it does not encompass citizen engagement. A third example is the China Future City Lab (MIT CFC 2020), an urban research and innovation programme hosted by MIT that facilitates and creates start-up teams, comparative studies and test sites for urban innovations and policy experiments.

While urban living labs have been used in the United States and Europe for many years, in China they are a more recent phenomenon. There are also several differences between European and Chinese approaches, with citizen engagement and cocreation for the time being mainly taking place in Europe. However, recent examples of urban living lab-like activities in Wenjiang (POLITO 2019) and Wuhan (UN-Habitat 2018) show that citizen engagement approaches such as community planning and place making are becoming more widespread in Chinese settings as well.

3.2. Sino–European Expert Workshops to Fine-Tune the Urban Living Lab Scope

Based on the initial results of the literature study, the urban living lab as a concept has been tested both in Europe and China. Especially in Europe the research focus and practice on ULLs are active; however, there are some different understandings of the concept and operation mechanisms between China and Europe. As summarised above, two expert workshops were conducted with European and Chinese participants, one in Europe and one in China. During these workshops, a design thinking methodology (Brown 2009) was used to understand the expectations and experiences of the invited experts regarding urban living labs. The participants were asked to discuss best-case and worst-case scenarios of urban living labs in order to develop a common understanding of what would entail an appropriate scope, criteria and framework conditions for the selection and implementation of Chinese urban living labs in cooperation with a European–Chinese expert team.

The following core ingredients were identified for successful urban living labs within the scope of European–Chinese cooperation: prior contacts and cooperation with key local actors, in particular local government; a firm anchored in local context and existing value chains, in particular actors with prior experiences of urban transformation; opportunities to engage local stakeholders and stakeholder ecosystems, facilitate dialogue, build trust and credibility, support mutual understanding, gain public and government support, and secure involvement of local universities or research organisations (TRANS-URBAN-EU-CHINA 2019b). Storytelling was discussed as an essential ingredient for the development of the urban living labs, using narratives to connect with local stakeholders, help them make sense of the context, gain their trust and have them share their experiences (Davidson 2017).

Based on these criteria, potential living labs were identified: Tianjin, Wuhan, Jingdezhen, Xiong’An and Wenjiang. Three of these case studies will be discussed and analysed in this chapter, to showcase the diversity of approaches and learnings available from the cases: Wuhan, Tianjin and Jingdezhen. For a more detailed description of engagement activities within the urban living labs, please refer to TRANS-URBAN-EU-CHINA (2020).

3.3. Case Study 1: Wuhan

The Wuhan urban living lab was created based on the cooperation of four complementary local stakeholder organisations: Wuhan University, the Wuhan Urban Spatial Planning Research Center (WLSP), the UN-Habitat China office and local project developer *Shui on land*. Each of these four organisations had long-standing cooperative agreements with at least one or more of the authors of this chapter; additionally, WLSP and UN-Habitat had prior cooperation (since 2016).

Hence, a basis of trust, cooperation and communication had already been established prior to creating the living lab.

The basis for the cooperation was created during the UN-Habitat placemaking week in December 2018, an international event for experts, students and local stakeholders, with the quality of the local Wuhan urban environment at the core. During meetings, study visits and workshops with the four stakeholder organisations, Chinese and European experts presented the vision and aims of creating socially inclusive cities, and the local stakeholders identified the most urgent local needs. The key priority identified, was to create transformation pathways for a rapidly growing city, both in terms of upgrading urban heritage areas and integration of surrounding rural communities in the expanding urban environment. This priority area included three key elements for more socially integrative urban environments: making the city more attractive for young people, the need to provide quality public spaces in dense urban areas and rising inequality among residents.

These challenges formed the scope of a series of interaction activities with the four core local stakeholders and their cooperation partners. European and Chinese researchers within these topics organised the activities and participated together with local stakeholders to form a bridge between science and practice. The interaction activities included stakeholder workshops, knowledge cafés (Elliott et al. 2005; Pasher and Ronen 2011), the above-mentioned placemaking week (UN-Habitat 2018), summer schools, secondments of Wuhan experts to Europe, study visits, expert interviews, a web workshop on data science and communities and similar activities (TRANS-URBAN-EU-CHINA 2020).

This suite of participatory methods offered the local stakeholders a platform for exchanging ideas with Chinese and international experts, and generated ideas on how to solve particular challenges building on local resources and international best practices.

3.4. Case Study 2: Tianjin

The Tianjin living lab was created using a top-down approach (Leminen 2013), using the local authorities as an entry point. During a series of introductory meetings and site visits between Chinese and European experts with the local decision makers of the Tianjin free trade zone, the latter expressed their intention to upgrade the area to become a mixed-use and more socially inclusive area, a transition to be performed in cooperation with the planning authorities of Tianjin. With the local authorities, the Tianjin free trade zone was selected as a dedicated area for the living lab, and priorities were set for increasing the social inclusiveness of this area. The key challenge to be addressed in the living lab is transforming the area from a pure work environment into a more mixed-use, liveable urban area to create a multifunctional public space (Jacobs [1961] 1993).

Based on this goal, a political decision was made to launch the living lab in a public ceremony during a high-level Sino–European event, and to broadcast to the local media. A dedicated local office space was transformed into living lab offices, called the “EU-China Research and Innovation Laboratory”.

After the launch, a suite of workshops and knowledge cafés were organised in which the local workforce and residents were invited to identify the key challenges in the local area and were presented with international and Chinese best practices. Based on these presentations, concrete opportunities for improving the urban fabric and facilities in the living lab were discussed.

3.5. Case Study 3: Jingdezhen

Similar to the Tianjin living lab, the Jingdezhen living lab was created using a top-down approach in cooperation with local authorities. After a series of introductory meetings, a cooperation agreement was signed in the presence of high-level decision makers, consolidating the intention to cooperate on developing a smart city platform with cultural heritage at the core. A seminar and study visit were organised in which Chinese and European experts presented international best practices for socially inclusive cities. Under the guidance of the local decision makers, the visiting Chinese and European experts visited the heritage sites that define Jingdezhen’s identity (the city is known as the “Porcelain Capital” due to its longstanding tradition of porcelain production), as well as the surrounding areas that will be embedded within the upcoming expansion of the city. Some of the visited heritage areas were the Imperial Kiln Sites and Jingdezhen Ceramic Industry Heritage Museum.

Together with invited decision makers from city and regional authorities, the most promising local challenges were identified and discussed, all contributing to a balance between culture, environment and economy. Similar to Wuhan, the city identified upgrading of its heritage centre and controlled expansion into a rural area as core topics for cooperation. A location for the living lab headquarters was dedicated by the local authorities in the heritage area. A series of cooperation activities were defined, including on-site engagement activities with local stakeholders as well as regular Sino–European events to link local learnings to international practices. A fact-finding mission was planned to be held by European and Chinese experts, combined with field studies by students, in preparation of an international expert event the year after.

Nevertheless, due to a political shift, the living lab activities were no longer prioritised by the local authorities and the cooperation activities were cancelled. Despite its customisation to local needs and priorities, the living lab was not sufficiently anchored across several municipal decision makers and entities, making it vulnerable to political changes. Unfortunately, this left the living lab dormant despite promising ideas and the initial enthusiasm. There are several potential ways

this can be explained. One relates to the typical method of governance at Jingdezhen Municipality, a strict top-down administration system, which directly challenged the open innovation approach taken. Another issue relates to trust and a failure to assess the types of anchorage that project participants had in the municipality. Swift political changes strongly affect decision making in China, and ultimately the ULL project was not deemed interesting or relevant enough to the local government. This implies that the cocreation process initiated with local stakeholders was not robust enough to allow for iterations that would be beneficial to establish a stronger anchorage. As such, this case illuminates the fact that any form of uncertainty, be it political, time-related or resource-related, cannot be controlled and a degree of preparedness is necessary to not be taken by surprise.

4. Conclusions and Recommendations

The experiences from the three urban living labs as presented here, combined with literature studies and Sino–European expert workshops, foreground two particularly central aspects relating to societal transformation. On the one hand, a successful long-term urban living lab needs to include technical, spatial, social, economic, regulatory and other aspects in order to be able to identify and address complex urban challenges. On the other hand, an urban living lab will only be successful if properly embedded in a local innovation ecosystem of professional and citizen stakeholders, to give them the confidence and capacity to reshape their environments, to ensure that their everyday knowledge is used and shared optimally and, in short, to boost capacity for transformation at the local level.

The experiences gathered over a three-year long practice on ULL cases in Chinese cities as described here also reflect some differences between Europe and China in how the ULL concept is perceived. Clearly, the Chinese cases presented here show a larger flexibility to the concept, which implies that more time is needed in order to form a common understanding. This also implies that the initial ULL idea might be adapted as part and parcel of the alignment process. In promoting ULL activities in China, recognition and endowment from the local authority is crucial, and the ULL activities need to align with the policy and urban development strategy. This suggests that identifying the key local ambitions and activities before engaging in ULL initiatives is useful. However, the effectiveness of ULL activities depends on creating a wide, diversified and iterative involvement with local stakeholders, which can boost the open innovation and guide to a pathway of socially inclusive cities. Using a bottom-up approach will engage local stakeholders but might lack political anchoring to produce actual impacts on the local environment. Using a top-down approach, on the other hand, will have political anchoring but will ultimately require intensive cooperation with local stakeholders in order to develop an actionable programme relevant to local realities. Nevertheless, as the case of Jingdezhen showed, top-level

priorities can change quickly, and a top-down approach does not guarantee that ULL activities will be carried out.

As a recommendation for future research, there are several questions relating to the level of flexibility and improvisation in dealing with local ULL efforts in a Chinese context that would be interesting to study closer. Could, for instance, ULLs gain a better understanding of the type of flexible and experimental governance very often witnessed in Chinese policy making? Are there ways of facilitating studies that would lead to both a local benefit and a more systematic way of studying the form of “directed improvisation” identified by Ang (2016)? Answers to such questions would also allow for a more dynamic engagement with the ways in which local policy makers respond to and adapt to urban development issues that ultimately impact open innovation processes in more integrative cities.

Author Contributions: This article has several authors with different contributions as follows: Conceptualisation, A.W., Y.W. and M.K.; responsible for urban living labs, A.W., Y.W., P.A. and C.L.; data collection, Y.W., P.A., N.K., A.C., E.P., M.H., L.S., Y.Y., B.C., M.K. and O.H.; community of community, E.P., M.H. and L.S. All authors have read and agreed to the published version of the manuscript.

Funding: This research received funding from European Union’s Horizon 2020 research and innovation program under grant agreement No. 770141.

Acknowledgments: This article is practice-based with contribution of a group of local stakeholders from urban living lab cities who have been providing relevant data, and cohosting urban living lab workshops. The local supporters are UN Habitat China Office, Zhenshan Zhang, Sheng Ying; Wuhan Land Use and Spatial Planning Research Centre, Jie Song, Yifeng Zhang, Dandan Tong; Wuhan University, Lingbo Liu, Hao Wu; Tianjin Free Port Zone, Jian Zheng.

Conflicts of Interest: The authors declare no conflict of interest.

References

- Ang, Yuenyuen. 2016. *How China Escaped the Poverty Trap*. Ithaca: Cornell University Press.
- Arnstein, Sherry R. 1969. A Ladder of Citizen Participation. *Journal of the American Planning Association* 35: 216–24.
- Beijing City Lab. 2020. Beijing City Lab About. Available online: <https://www.beijingcitylab.com/about-1/> (accessed on 13 September 2020).
- Brown, Tim. 2009. *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation*. New York: Harper Business.
- Çalışkan, Olgu. 2012. Design thinking in urbanism: Learning from the designers. *Urban Design International* 17: 272–96. [CrossRef]
- Carayannis, Elias G., and David F. J. Campbell. 2009. ‘Mode 3’ and ‘Quadruple Helix’: Toward a 21st century fractal innovation ecosystem. *International Journal of Technology Management* 46: 201. [CrossRef]

- Carstensen, Helle Vibeke, and Christian Bason. 2012. Powering collaborative policy innovation: Can innovation labs help? *The Innovation Journal: The Public Sector Innovation Journal* 17: 1–26.
- Chesbrough, Henry. 2003. *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Boston: Harvard Business School Press.
- Chronéer, Diana, Anna Ståhlbröst, and Abdolrasoul Habibipour. 2019. Urban Living Labs: Towards an Integrated Understanding of their Key Components. *Technology Innovation Management Review* 9: 50–62. [CrossRef]
- Curley, Martin, and Bror Salmelin. 2018. Open Innovation 2.0. The New Mode of Digital Innovation for Prosperity and Sustainability. In *Innovation, Technology, and Knowledge Management*. Cham: Springer International Publishing.
- Davidson, Brett. 2017. Storytelling and evidence-based policy: Lessons from the grey literature. *Palgrave Communications* 3: 17093. [CrossRef]
- Elliott, Janice, Sara Heesterbeek, Carolyn J. Lukensmeyer, and Nikki Slocum. 2005. *Participatory Methods Toolkit: A Practitioner's Manual*. Edited by Stef Steyaert and Hervé Lisoir. Brussels: King Baudouin Foundation/Flemish Institute for Science and Technology Assessment, p. 185ff.
- ENoLL. 2020. European Network of Living Labs, China LL Housing Lab (China Living Lab for Future Housing). Available online: <https://enoll.org/network/living-labs/?livinglab=china-ll-housing-lab-china-living-lab-for-future-housing> (accessed on 13 September 2020).
- GUST. 2017. The Emerging Landscape of Urban Living Labs: Characteristics, Practices and Examples. GUST Project Document. Available online: http://lup.lub.lu.se/search/ws/files/27224276/Urban_Living_Labs_Handbook.pdf (accessed on 13 September 2020).
- Jacobs, Jane. 1993. *The Death and Life of Great American Cities*. New York: The Modern Library. First published 1961.
- Leminen, Seppo. 2013. Coordination and Participation in Living Lab Networks. *Technology Innovation Management Review* 2013: 5–14. [CrossRef]
- JPI Urban Europe. 2015. Transition towards Sustainable and Liveable Urban Futures: The Strategic Research and Innovation Agenda of JPI Urban Europe. Available online: <https://jpi-urbaneurope.eu/app/uploads/2016/05/JPI-Urban-Europe-SRIA-Strategic-Research-and-Innovation-Agenda.pdf> (accessed on 24 May 2019).
- JPI Urban Europe. 2017. Urban Living Labs by JPI Urban Europe. Available online: <https://jpi-urbaneurope.eu/app/uploads/2018/01/Urban-Living-Labs-info-sheet-draft-171123-version-8.2-PRINT.pdf> (accessed on 27 May 2019).
- Mazzucato, Mariana. 2013. *The Entrepreneurial State. Debunking Public vs Private Sector Myths*, 3rd ed. London: Penguin Random House.
- MIT CFC. 2020. The MIT China Future City Lab. Available online: <https://www.cfclab.mit.edu/> (accessed on 13 September 2020).

- Molinari, Frank. 2011. *Best Practices Database for Living Labs: Overview of the Living Lab Approach*. Alcotra Innovation Project. Available online: <https://docplayer.net/12847162-Best-practices-database-for-living-labs-overview-of-the-living-lab-approach-living-lab-best-practice-database-specification.html> (accessed on 13 September 2020).
- Moulaert, Frank, ed. 2013. *The International Handbook on Social Innovation: Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham: Edward Elgar Publishing.
- Pasher, Edna, and Tuvya Ronen. 2011. *The Complete Guide to Knowledge Management*. Hoboken: John Wiley & Sons, pp. 112–14.
- Pasher, Edna, Otthein Herzog, Mor Harir, Yaara Turjeman, and Wu Zhiqiang. 2018. Creating and enabling ecosystems for open innovation: Challenges and how to overcome them. In *Exploring the Culture of Open Innovation. Towards an Altruistic Model of Economy*. Edited by Piero Formica and Martin Curley. Bingley: Emerald Publishing, pp. 201–20.
- POLITO. 2019. 2019 International Forum & Workshop on Community Planning Chengdu (Wenjiang), China—29/31 August. Available online: <http://chinaroom.polito.it/chengdu-international-forum/> (accessed on 13 September 2020).
- Roman, Mona, Henry Varga, Vladimir Cvijanovic, and Alasdair Reid. 2020. Quadruple Helix Models for Sustainable Regional Innovation: Engaging and Facilitating Civil Society Participation. *Economies* 8: 48. [CrossRef]
- Prahalad, C. K., and Venkat Ramaswamy. 2004. Co-creating unique value with customers. *Strategy & Leadership* 32: 4–9.
- Ravazzi, Stefania. 2016. When a government attempts to institutionalize and regulate deliberative democracy: The how and why from a process-tracing perspective. *Critical Policy Studies* 11: 79–100. [CrossRef]
- Savini, Federico, Stan Major, and Willem Salet. 2017. Dilemmas of planning: Intervention, regulation, and investment. *Planning Theory* 14: 296–315. [CrossRef]
- Scholl, Christian, Gerhard Ablasser, Mette Agger Eriksen, Nik Baerten, Johanna Blok, Eric Clark, Ron Cörvers, Wolfgang Domian, Thomas Drage, Maja Essebo, and et al. 2017. Guidelines for Urban Labs, URB@Exp Project 2014–2017. Available online: <https://www.diva-portal.org/smash/get/diva2:1404995/FULLTEXT01.pdf> (accessed on 8 May 2019).
- Steen, Kris, and Ellen van Bueren. 2017. *Urban Living Labs: A Living Lab Way of Working*, 1st ed. Amsterdam: AMS Institute, Available online: <http://www.ams-institute.org/news/out-now-urban-living-labs-a-living-lab-way-of-working/> (accessed on 13 September 2020).
- SubUrbanLab. 2016. Urban Living Labs—As Arenas for Co-Creation in Urban Areas. Available online: http://suburbanlab.eu/wp-content/uploads/2016/05/SubUrbanLab_booklet_screen.pdf (accessed on 7 May 2019).
- TRANS-URBAN-EU-CHINA. 2018. Project Deliverable Setting Up the Big Data Analytics Framework Including Open Data and the ‘Online Community of Communities. Available online: http://transurbaneuchina.eu/fileadmin/user_upload/tuec/files/Deliverables/TRANS-URBAN-EU-CHINA_D4.1_CIUC_2018_V1.0.pdf (accessed on 13 September 2020).

- TRANS-URBAN-EU-CHINA. 2019a. Theoretical Aspects of Transition towards Urban Sustainability and the Role of Socially Integrative Cities. Available online: http://transurbaneuchina.eu/fileadmin/user_upload/tuec/files/Deliverables/TRANS-URBAN-EU-CHINA_D6.6.pdf (accessed on 10 January 2021).
- TRANS-URBAN-EU-CHINA. 2019b. Report on the Living Lab Knowledge Base D5.2. Available online: http://transurbaneuchina.eu/fileadmin/user_upload/tuec/files/Deliverables/TRANS-URBAN-EU-CHINA_D5.2_NTNU_20190705_v%204.0.pdf (accessed on 10 January 2021).
- TRANS-URBAN-EU-CHINA. 2020. Project Deliverable Urban Living Labs Transformative Knowledge. Available online: http://transurbaneuchina.eu/fileadmin/user_upload/tuec/files/Deliverables/TRANS-URBAN-EU-CHINA_D5.3_NTNU.pdf (accessed on 13 September 2020).
- UN-Habitat. 2018. 2018 International Placemaking Week (Wuhan, China). Available online: https://www.fukuoka.unhabitat.org/info/news/20190108_en.html (accessed on 13 September 2020).
- Voytenko, Yuliya, Kes McCormick, James Evans, and Gabriel Schliwa. 2016. Urban living labs for sustainability and low carbon cities in Europe: Towards a research agenda. *Journal for Cleaner Production* 123: 45–54. [CrossRef]
- Visser, Willemien. 2006. *The Cognitive Artifacts of Designing*. Mahwah: Lawrence Erlbaum Associates.

© 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Abstracts

Towards a Common Understanding of Socially Integrative Cities in Europe and China

by Paulina Schiappacasse, Bernhard Müller and Jianming Cai

Urbanisation is recognised as a powerful force supporting economic growth and innovation. However, as more people have moved to cities in search of new opportunities, the scale of spatial, environmental, and socio-economic inequalities has increased, remaining more than ever an unmet common challenge. In Europe, many blackspots of urban decay have evolved in cities over the past decades. In China, cities have to deal with a number of specific challenges, especially those associated with the strict hukou (household registration) system, and with the massive land conversion stimulated by fiscal reforms of the past. In both parts of the world, new initiatives have been developed in order to deal with problems of segregation and exclusion. Although they differ considerably according to specific preconditions and their societal embeddedness, the objective of this article is to develop a common understanding of socially integrative cities in Europe and China. The work is mainly based on literature analysis, expert interviews, and intensive group discussions. First, the article looks at the relevance of the topic. Second, it traces approaches in Europe and China to promote socially integrative cities back to their origins, and it discusses certain challenges, especially with regard to China. Third, the results of expert meetings on developing a common understanding of socially integrative cities are presented. Five dimensions and twelve features are derived and explained. They are considered as an analytical concept and a general orientation for shaping policies towards promoting socially integrative cities. Finally, conclusions are drawn. The concept of the “socially integrative city” goes beyond the notion of the “inclusive city” as developed in the UN 2030 Agenda for Sustainable Development and the New Urban Agenda. The five dimensions and twelve characteristics of the concept have a global reach. They can be applied anywhere, and they have the potential to complement the respective targets of the Sustainable Development Goals. The article is of interest for a broad group of stakeholders from academia and practice, e.g., experts in urban planning and community development, who are interested in contributing to make cities more sustainable, and especially to enhance social integration.

Managing Urban Expansion in Europe: New Impulses for People-Centred Development in China?

by Paulina Schiappacasse, Bernhard Müller, Jianming Cai and Enpu Ma

The rapid growth in the urban population in China in recent decades has been paralleled by a massive expansion of urbanised land, promoted by policies oriented towards land development. On the contrary, in Europe, for at least three decades, there have been many efforts to manage urban expansion in a more sustainable way. Against this background, the article has two objectives: to review urban expansion in China and Europe, and to look at some European approaches oriented towards limiting urban expansion and promoting social integration. European experiences may be relevant and inspiring for shaping people-centred, i.e., socially integrative, urban expansion in China. Methodologically, the article is based on analyses of the literature and documents as well as on expert interviews, group discussions and site visits.

Land Management for Socially Integrative Cities in Europe

by Julia Suering, Andreas Ortner and Alexandra Weitkamp

The process of land development in urban renewal and urban expansion areas and its instruments in Europe is the topic of this chapter. Good practice examples from selected European countries are analysed regarding the implementation of land management instruments for promoting socially integrative cities. The results are based on qualitative research. The systematization of land management instruments is derived from a structured literature review. Good examples of land management instruments are analysed with regard to promoting social aspects. Municipalities can use the instruments to manage land use—e.g., for housing, technical and social infrastructure. The implementation of different instruments can influence the supply of the municipality with affordable housing and the realization of technical and social infrastructures. All selected countries use tailored instruments to reach their municipal goals. It becomes clear that negotiation processes are a well-established approach for stakeholders to participate in the development process.

Towards Socially Integrative Urban Regeneration—Comparative Perspectives from China and Europe

by Stefanie Roessler, Jianming Cai, Jing Lin and Mengfan Jiang

The article focuses on the current framework, challenges and experiences of socially integrative urban regeneration in China and Europe. Urban regeneration plays a crucial role in achieving sustainable urban development in both China and Europe. To understand the specific challenges as well as potentials of this urban development strategy, we consider the different pathways, origins and practices in these two contexts need to be considered. This includes a comparative view of terms and definitions used in the debate and practice of urban regeneration. By examining the individual drivers, it is possible to determine the framework for urban regeneration in Europe and China. Drawing on the concept of socially integrative urban development, the challenges of urban regeneration in China and the experiences in Europe will be described and summarized.

Community Building through Public Engagement: Variety in Europe and China

by Thea Marie Valler, Marius Korsnes, Jiayan Liu, and Yulin Chen

Public participation in the regeneration of neighborhoods has increasingly become a key objective in public planning. However, the extent to which such processes are anchored in the community varies greatly. To ensure inclusive community building, one must pay close attention to the groups of actors involved in the processes. This chapter investigates different examples of community building in Europe and China, focusing on who is participating. A variety of cases show the importance of a deep-rooted process analyzed through a modified participation ladder, and classification of bottom-up and top-down initiatives. The role of formal procedures and regulations of participation are also examined, particularly with respect to China. When superficial forms of participation are utilized, the processes can run the risk of merely legitimize top-down plans. On this basis, we argue that a wide variety of actors should be involved early in the process to ensure that residents also have a say in the definition of the issues at hand, and also the methods and tools used for participation.

Transformative Factors of Post-Industrial Urban Spaces in China and Italy

by Badiia Hamama, Maria Paola Repellino, Jian Liu and Michele Bonino

Both Chinese and Italian cities have faced significant transformations in the post-industrial era, in particular the path towards more socially integrative urban spaces in the face of social, political and economic transitions. Based on a literature review and selected case studies from China and Italy, this article attempts to shed light on the processes and dynamics of the redevelopment of their urban spaces in light of the transition to a post-industrial period. A shift in the economic and political apparatus is always associated with challenges and opportunities, as well as with social and spatial impacts, which can sometimes result in irreversible damage or successful development experiences. Although using different approaches and strategies to face the different constraints in the transitional period, particularly the rising land value, what emerged from both the Chinese and the Italian experience is an alternative sensitivity towards the protection and reuse of the pre-existing industrial urban fabric, an approach mostly based on reducing the practices of demolition and total replacement, and increasing focus on the engagement of local communities as an integral part of the decision-making process. In spite of the effort to produce qualitative urban spaces oriented to balance the physical and social transformations, achieving socially integrative cities is still a challenge in both urban contexts.

Looking at Socially Integrative Cities through the Educating City: The Example of Educational Museums in Europe and China

by Fabrizio d'Aniello, Zhuqing Xu, Elisabetta Patrizi and Stefano Polenta

This contribution aims to show how the idea of an educating city can help to find effective ways of social integration capable of promoting the well-being of individuals and the community. In this direction, the concept of an educating city is adopted as a key to re-read the concept of a socially integrative city through an eminently educational perspective. The education channel, rethought through multiple learning initiatives capable of following alternative paths to those of school and university experiences (formal education), allows enhancing the human potential and wealth of knowledge and skills of the city, making all citizens protagonists and participants. In addressing this issue, a specific case study will be analyzed: educational museums. The aim is to show how the museum, as a non-formal education space and an expression of collective identity, can play an important role in connoting a city as an educating city. Specifically, both the European and

Chinese realities will be examined to offer one of the possible insights into how the city is a reality in progress to be explored, which can grow and improve together with its citizens if you work in the direction of community education (Dewey) by rediscovering a place that, like museums, can contribute to enrich the social capital of a community.

The Role of Heritage in Building a Socially Integrative City: A Comparative Approach

by Lisbet Sauarlia and Yu Wang

This article aims to contribute to answering the research question of how to create socially integrative cities during the fast urban transition that has been adopted by H2020 TRANS-URBAN-EU-CHINA. The article is specifically focused on the critical role of community in urban transition in historical districts and uncovers the kind of role the community can play in such a process. The article compares two cases: the gentrification process since the 1970s in the Bakklundet district in Trondheim Norway and, in the Xi'an Beiyuanmen Muslim district, the urban regeneration plan in the 2000s in Xi'an China. The transformation in Bakklundet and in the Xi'an Muslim district has showcased that community plays an important role and that community building in urban transition is a key element for preserving the value of historical districts (neighborhoods).

Embracing Complexity Theory for Effective Transition to Socially Integrative Cities

by Edna Pasher, Lee Sharir, Otthein Herzog, Yahel Nudler, Buyang Cao, Zhiqiang Wu and Mor Harir

This article offers complexity theory as a theoretical framework for a transition into socially integrative cities enabled by digitalization. To increase our understanding of the change processes in cities, we can look to the natural sciences for inspiration—specifically, to complexity theory. According to this theory, the city is a living organism, an ecosystem in which there are close relationships among streams of resources, knowledge, and people. It is a system in which, as in nature, a phenomenon of co-evolution occurs—the emergence of processes and self-organization of all agents in the system—that provides the creation of a new order in a natural evolutionary process. The community is one of the key success factors to make cities more attractive to residents, business, and tourists. Community building needs enabling infrastructure for its creation and development. The city can

function as a hub for community-building and, in this way, encourage and enable the natural self-emergence of the residents into different communities of interest. Digital technology makes it possible to develop communities on-line in addition to community-building off-line. The process described in this article includes the conceptual framework that is based on complexity theory and the methodological concept based on Urban Living Labs. In addition, we conducted different types of experiments as part of the empirical action study to validate the theoretical basis of the complexity theory. The experiments include a variety of online activities and a few face-to-face activities. The combination of both online and offline support motivates stakeholders to participate and collaborate in, and register on, the platform. Inspired by complexity theory, we believe that urban planners and policy makers should explore the principles identified in the research of complex adaptive systems, such as emergence, self-organization, co-evolution and their translation into R&D projects as user-centered design (UCD), which inspired us in our development of the online Community of Communities (CoC). We believe that one cannot plan a new city or a new neighborhood or any urban renewal activities without engaging all current and future stakeholders: planners, policy makers, academia, residents, businesses and even tourists. This was our focus too, as described in this chapter. In addition, Tel Aviv's case study is presented as an example of a process of building an online platform, Community of Communities, that can contribute to the transition towards digital city.

Enhancing Capacity Building for Urban Transformation as a Means to Close the Planning-Implementation Gap in Europe and China

by Susanne Meyer, Christoph Brodnik, Gudrun Haindlmaier, Hans-Martin Neumann, Daiva Jakutyte-Walangitang, Jianming Cai, Yan Han and Jing Lin

Building socially integrative cities is high on the European Agenda, and it has also become one of the top priorities of the Chinese government's commitment to fostering sustainable urbanisation and the development of smart cities. However, there is a gap between these aspirations, reflected in strategic documents and urban plans, and the actual realisation of these aspirations in practice. Against this background, this research explores and illustrates innovative approaches in European and Chinese smart city projects that have contributed to a better alignment of city planning and implementation. In doing so, the paper draws on the transformative capacity concepts and operationalises them for the city planning and implementation context. Equipped with this framework, the research showcases a selection of the most innovative approaches that European and Chinese smart city projects have successfully employed. Furthermore, the paper analyses the

dimensions in which these approaches have helped to build capacities that can foster urban transformation. Based on the analysis, the paper reflects on further research that is needed to systematically understand innovative approaches and tools to learn to replicate in other cities, and the paper outlines policy recommendations to foster transformative capacities in cities.

Social Cost–Benefit Analysis—Supporting Urban Planning and Governance for Enhancing Social Integration

by Andrea Ricci, Riccardo Enei and Enpu Ma

The ultimate objective in applying social cost–benefit analysis (SCBA) techniques is the monetary valuation of impacts, such as air pollution, loss of amenities, congestion (urban sprawl), damage to public health, ecosystems services and quality of life, for which market prices may not be available. All these fields of application are relevant to the topic of building socially integrative cities. They contribute, directly or indirectly, through the quantification of impacts and the understanding of causal factors, to the urban environment and quality of life, which are the cornerstones of socially integrative cities. Quantification through SCBA techniques better reflects the value society attaches to non-market goods and services, enabling urban planners and policymakers to consider the net social welfare effects of urbanisation processes. For example, land use efficiency may be improved if the costs of using natural resources and polluting the environment are taken into account.

Regression Analyses of Air Pollution and Transport Based on Multiple Data Sources—A Decision Support Example for Socially Integrative City Planning

by Mingyue Liu, Buyang Cao, Mengfan Chen, Otthein Herzog, Edna Pasher, Annemie Wyckmans and Zhiqiang Wu

In this chapter, we present a study on the inter-relationships between air pollution, transportation, industries, and social activities in a city based on multiple data sources for Tianjin. Tianjin, as one of the locations with Chinese urban living labs (living laboratories (or living labs) are spaces for co-innovation through participatory, transdisciplinary and systemic research), was selected by the TRANS URBAN EU-CHINA project as a representative city because of its size, its industries, and its importance as a main traffic node in order to verify the project results in practice. This chapter describes a top-down approach for the analysis of air pollution where multiple impact factors are taken into account. The insights gained provide evidence for decision-making to facilitate sustainable development with respect to

air pollution, which is a valuable goal in order to create more socially integrative cities, as it impacts greatly on the health and well-being of the people in affected parts of the city. The models and analyses identify some important factors impacting the air quality in Tianjin. Furthermore, a cost model for air pollution reduction provides insight into causal factors that should be taken into account while making decisions to lower air pollutants. The models may be beneficial for cities in China and elsewhere and are a contribution to evidence-based urban planning for socially integrative cities.

Estimating the Replication Potential of Urban Solutions for Socially Integrative Cities

by Loriana Paolucci

In the previous chapters, the topic of sustainable transition toward socially integrative and sustainable cities was widely discussed and several tools and advanced methods were introduced as useful instruments to facilitate this process. All these tools are valid aids for urban planners and decision-makers in implementing specific urban solutions. Often, however, the fact that a solution is successful in a given context does not imply that it can be easily replicated in other situations and bring the same benefits. Notably, successful urban solutions in Europe, could face various difficulties when implemented in the Chinese context. Thus, a thorough analysis of the replication potential is required for the selection of the most appropriate solutions for any given city. This article illustrates a new methodology for the estimation of the replication potential of urban solutions in different contexts to support successful transition toward socially integrative cities. The novelty of this method is in the combination of quantitative data with qualitative information collected from local stakeholders, and in the assessment of five specific dimensions: socio-cultural, institutional, technological, environmental and economic (SITEE replicability method). This multi-dimensional analysis allows us to best describe and understand the complexity of the different cities' ecosystems, helping to identify the most relevant factors that may limit or facilitate replication. Cities are thus guided in the selection of those urban solutions that could be best replicated in their local context, and are widely supported in the urban planning phase and in the provision of more socially integrative initiatives. The application of SITEE to the Chinese context might have interesting implications. China's city-tier classification system can be adapted to SITEE so as to broaden and maximize the results and the impacts that can be obtained for one city, leading to the identification of a group of solutions that can be applied all the cities belonging to the same tier.

Urban Living Labs as Instruments of Open Innovation: Examples of Sino–European Cooperation

by Annemie Wyckmans, Yu Wang, Marius Korsnes, Pål Aune, Yang Yu, Chang Liu, Edna Pasher, Mor Harir, Lee Sharir, Otthein Herzog, Buyang Cao, Nikolaos Kontinakis and Anthony Colclough

This chapter analyses how Urban Living Labs may be used as instruments of open innovation. The analysis is based on on-the-ground experiences with Urban Living Labs in China (in the cities of Wuhan, Tianjin and Jingdezhen), in close contact with local stakeholders and European and Chinese experts. These experiences were paired with desk research, local stakeholder workshops and Sino-European expert workshops, in order to better understand the challenges that were identified in the Urban Living Labs, and to explore pathways towards addressing these challenges. Based on these methods, open innovation-based principles are discussed for Urban Living Labs to function as meeting arenas to support communities' diversity, significance and connectedness, where participants can experiment with practical ideas and solutions towards more a cohesive, inclusive and sustainable every-day life.

Contributors

ALEXANDRA WEITKAMP

Prof. Dr.-Ing., Geodetic Institute,
Chair of Land Management, Technische
Universität Dresden, Dresden, Germany.

ANDREA RICCI

Vice President ISINNOVA, Italy.

ANDREAS ORTNER

Dr. rer. nat., Geodetic Institute,
Chair of Land Management, Technische
Universität Dresden, Dresden, Germany.

ANNEMIE WYCKMANS

Professor, Department of Architecture
and Planning, Norwegian University
of Science and Technology, Trondheim,
Norway.

ANTHONY COLCLOUGH

EUROCITIES asbl, Brussels, Belgium.

BADIAA HAMAMA

PhD Researcher, Department of Urban
Planning and Design, School of
Architecture, Tsinghua University,
Beijing, China.

BAOJUN YANG

China Academy of Urban Planning and
Design (CAUPD), Beijing, China.

BERNHARD MUELLER

Professor, Faculty of Environmental
Sciences, Technische Universität Dresden,
Dresden, Germany.

BUYANG CAO

Professor, CIUC, Tongji University,
Shanghai, China.

CHANG LIU

Senior Researcher, China Academy of
Urban Planning and Design, Beijing,
China.

CHRISTOPH BRODNIK

Dr., AIT Austrian Institute of Technology,
Vienna, Austria.

DAIVA WALANGITANG

AIT Austrian Institute of Technology,
Vienna, Austria.

EDNA PASHER

Dr., Israel Smart Cities Institute, Tel Aviv,
Israel.

ELISABETTA PATRIZI

Professor, Department of Education,
Cultural Heritage and Tourism, Macerata
University, Macerata, Italy.

- ENPU MA
Dr. IGSNRR, Chinese Academy of Sciences (CAS).
- FABRIZIO D'ANIELLO
Professor, Department of Education, Cultural Heritage and Tourism, Macerata University, Macerata, Italy.
- GUDRUN HAINDLMAIER
Dr., AIT Austrian Institute of Technology, Vienna, Austria.
- HANS-MARTIN NEUMANN
Thematic Coordinator for Smart and Carbon-Neutral Urban Development, AIT Austrian Institute of Technology, Vienna, Austria.
- JIAN LIU
School of Architecture, Tsinghua University, Beijing, China.
- JIANMING CAI
Dr. Professor IGSNRR, Chinese Academy of Sciences (CAS), Beijing, China.
- JIAYAN LIU
Associate Professor, Department of Urban Planning, School of Architecture, Tsinghua University, Beijing, China.
- JING LIN
Dr. IGSNRR, Chinese Academy of Sciences (CAS), Beijing, China.
- JULIA SUERING
M. Sc., Geodetic Institute, Chair of Land Management, Technische Universität Dresden, Dresden, Germany.
- LEE SHARIR
Israel Smart Cities Institute, Tel Aviv, Israel.
- LISBET SAUARLIA
Associate Professor, Department of Architecture and planning, Norwegian University of Science and Technology, Trondheim Norway.
- LORIANA PAOLUCCI
ISINNOVA - Institute of Studies for the Integration of Systems.
- MARIA PAOLA REPELLINO
Research Fellow, Department of Architecture and Design, Politecnico di Torino, Torino, Italy.
- MARIUS KORSNES
Research Scientist, Department of Interdisciplinary Studies of Culture (KULT), Norwegian University of Science and Technology (NTNU), Trondheim, Norway.
- MENGFAN CHEN
Tongji University, Shanghai, PRC.
- MENGFAN JIANG
Technische Universität Dresden Germany.

MICHELE BONINO

Associate Professor, Politecnico di Torino,
Torino, Italy.

MINGYUE LIU

Tongji University, Shanghai, PRC.

MOR HARIR

Israel Smart Cities Institute, Tel Aviv,
Israel.

NIKOLAOS KONTINAKIS

EUROCITIES asbl, Brussels, Belgium.

OTTHEIN HERZOG

Professor, CIUC, Tongji University,
Shanghai, China.

PÅL AUNE

Research Assistant, Department of
Chemical Engineering and Planning,
Norwegian University of Science and
Technology, Trondheim, Norway.

PAULINA SCHIAPPACASSE

Dr.rer.nat, Faculty of Environmental
Sciences Technische Universität Dresden,
Dresden, Germany.

RICCARDO ENEI

Senior Reseacher, ISINNOVA, Italy.

STEFANIE RÖSSLER

Dr., Leibniz Institute of Ecological Urban
and Regional Development, Dresden,
Germany.

STEFANO POLENTA

Professor, Department of Education,
Cultural Heritage and Tourism, Macerata
University, Macerata, Italy.

SUSANNE MEYER

Dr., AIT Austrian Institute of Technology,
Vienna, Austria.

THEA MARIE VALLER

PhD Candidate, Department of
Interdisciplinary Studies of Culture
(KULT), Norwegian University of Science
and Technology (NTNU), Trondheim,
Norway.

YAHIEL NUDLER

Israel Smart Cities Institute, Tel Aviv,
Israel.

YAN HAN

Chinese Academy of Sciences, Beijing,
China.

YANG YU

Dr., Lecturer, School of Urban Design
Wuhan, University Wuhan, China.

YU WANG

Dr., Senior Researcher, Department of
Architecture and Planning, Norwegian
University of Science and Technology,
Trondheim, Norway.

YULIN CHEN

Associate Professor, Department of
Urban Planning, School of Architecture,
Tsinghua University, Beijing, China.

ZHIQIANG WU

Professor, College of Architecture and
Urban Planning, Tongji University,
Shanghai, China.

ZHUQING XU

Chinese Academy of Science and
Technology for Development, Yuyuantan
South Road, Haidian District, Beijing,
China.

MDPI
St. Alban-Anlage 66
4052 Basel
Switzerland
Tel. +41 61 683 77 34
Fax +41 61 302 89 18
www.mdpi.com

MDPI Books Editorial Office
E-mail: books@mdpi.com
www.mdpi.com/books





This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 77014.

The material reflects only the authors' views. The European Union is not liable for any use that may be made of the information contained therein.



**TRANS-URBAN
EU-CHINA**
Research & Innovation
on Urban Transition

ISBN is 978-3-03936-678-1

