

Postprint: Strategic Systems Research on the Guangdong-Hong Kong-Macao Greater Bay Area from a Complex Systems Perspective

Authors: Zhang Xiaojuan, Jia Haiwei

Date: 2018-07-05T00:00:00+00:00

Abstract

[Purpose/Significance] As the development of the Guangdong-Hong Kong-Macao Greater Bay Area becomes a major national strategy for regional development in China, how to formulate and design the development strategy for the Guangdong-Hong Kong-Macao Greater Bay Area has become a critical issue currently confronted. [Method/Process] This paper, grounded in relevant theories of complex systems and combined with technology roadmapping tools, analyzes and depicts the elements, structure, and operational mechanisms of the strategic system of the Guangdong-Hong Kong-Macao Greater Bay Area. [Results/Conclusion] The strategic system is a subsystem within the urban system. The strategic system of the Guangdong-Hong Kong-Macao Greater Bay Area includes five major elements: strategic vision, strategic objectives, strategic tasks, strategic priorities, and strategic implementation, which are interconnected, interlinked, and progressively advancing. The strategic system of the Guangdong-Hong Kong-Macao Greater Bay Area is a subsystem that plays an important “hetero-organization” role within the overall system of the Guangdong-Hong Kong-Macao Greater Bay Area. It conducts purposeful planning, organizing, guiding, controlling, and coordinating of the operation and development of the social system, economic system, support system, and spatial system within the overall system of the Guangdong-Hong Kong-Macao Greater Bay Area, promoting the realization of the grand vision for the Guangdong-Hong Kong-Macao Greater Bay Area to become a world-class city cluster and a world economic bay area.

Full Text

Research on the Strategic System of Guangdong-Hong Kong-Macao Greater Bay Area from a Complex Systems Perspective

Zhang Xiaojuan, Jia Haiwei

College of Public Management, South China Agricultural University, Guangzhou

Abstract

[Purpose/Significance] As the construction of the Guangdong-Hong Kong-Macao Greater Bay Area (GHMGBA) has become a major national and regional development strategy for China, formulating and designing its development strategy has emerged as a critical challenge. **[Method/Process]** This paper employs complex systems theory combined with technology roadmap tools to analyze and delineate the elements, structure, and operational mechanisms of the GHMGBA strategic system. **[Result/Conclusion]** The strategic system constitutes a subsystem within the urban system, comprising five key elements: strategic vision, strategic objectives, strategic tasks, strategic priorities, and strategic implementation. These elements are interlinked, mutually reinforcing, and progressively hierarchical. The GHMGBA strategic system plays a vital “the organization” role (externally organized function) within the overall GHMGBA system, purposefully planning, organizing, guiding, controlling, and coordinating the operation and development of the social, economic, support, and spatial systems to advance the realization of the vision for a world-class urban agglomeration and a world-class economic bay area.

Keywords: strategic system; Guangdong-Hong Kong-Macao Greater Bay Area; complex system

Since the State Council proposed launching the cross-provincial Pearl River Delta Bay Area urban planning in 2017 and the GHMGBA was written into the Government Work Report in March 2017, the GHMGBA construction has become a major national and regional development strategy. Central and provincial governments have successively introduced policies to vigorously promote the development of the GHMGBA urban agglomeration, while local governments are actively formulating a series of policies to foster bay area economic development. The GHMGBA encompasses Hong Kong, Macao, and nine cities in the Pearl River Delta (Guangzhou, Shenzhen, Zhuhai, Foshan, Jiangmen, Dongguan, Zhongshan, Huizhou, and Zhaoqing). Its goal is to build a world-class urban agglomeration and a world-class economic bay area. The key to achieving this objective lies in planning and constructing the “2+9” cities as an integrated system, clarifying the main domains involved in the bay area construction and their interrelationships, formulating corresponding development strategies and

plans, and effectively promoting interconnectivity and collaborative cooperation among different cities and relevant fields within the bay area. This paper analyzes the elements, structure, and operational mechanisms of the GHMGBA strategic system to provide theoretical references for related planning formulation, policy development, and institutional mechanism establishment.

1.1 Connotation Analysis of Strategic Systems

The strategic system emerges from the integration of urban strategic planning and systems thinking. Traditionally, strategic research has been a fundamental method in enterprise management. However, with the increasing corporatization of cities, scholars have begun applying corporate strategic management concepts and methods to study, formulate, and implement urban strategic planning. From the perspective of urban strategy development history, Guangzhou's strategic planning in 2000 served as a pioneer, breaking through the conventional isolated individual city perspective and beginning to emphasize a city's regional status and regional integration. This approach focused on forward-looking (temporal), regional (spatial), strategic (content), and framework (form) issues that would significantly impact future sustainable urban development. Concurrently, urban strategy expanded beyond pure spatial planning to gradually encompass economic, social, environmental, and other aspects closely related to urban competitiveness and sustainable development. Since urban strategy takes the overall patterns of urban construction and development as its research object, involving multiple aspects of urban economy, society, environment, technology, and space, it must establish organic connections among these domains based on their relationships and modes of interaction. In this sense, urban strategy manifests as an organic system, necessitating systems thinking, which in turn makes urban strategic research more rigorous and scientific.

Based on the above analysis, the strategic system is a subsystem within the urban system that takes the overall patterns of urban construction and development as its research object. It first constructs a theoretical urban overall system by integrating core elements such as economy, society, ecology, and space in urban construction and development, along with their relationships and interaction modes. Then, through analysis of internal and external environments, it conducts long-term, holistic, and comprehensive planning for the city's future construction and development, and employs specific implementation mechanisms to purposefully intervene in the operation and development of the urban system, thereby guiding the urban system to evolve in the direction anticipated by humans. The strategic system generally comprises three components: strategic research, strategic planning, and strategic implementation. Strategic research clarifies the core elements within the urban system and their relationships and interaction modes through basic, thematic, and case studies to construct a theoretical urban system. Strategic planning analyzes the internal and external environments of urban development and uses specific planning techniques and methods to arrange and combine the main contents of urban

planning and construction in a particular order, presenting them in textual and graphic forms as the basis and scheme for urban construction and development. Strategic implementation refers to the methods and processes of intervening in and controlling urban construction and development according to strategic planning while receiving control feedback. Through strategic research, planning, and implementation, the strategic system guides and controls the urban system to develop in the expected direction.

1.2 Analysis of Strategic System Elements and Structure Based on Roadmap Tools

Strategic systems generally consist of components such as vision, objectives, means, subjects, and objects. To more clearly delineate the main contents and structural composition of the GHMGBA construction strategic system, this paper employs the roadmap method for analysis. Roadmap is a strategic management tool that organically integrates strategic vision, objectives, tasks, and action plans in a top-down planning approach. It coordinates stakeholders to form a unified mission and vision and uses structured, systematic methods to comprehensively consider the relationships among objectives, tasks, and resource guarantees. Based on the roadmap tool, the content and structure of the GHMGBA construction strategic system constructed in this paper are shown in [Figure 1: see original paper]. The strategic system elements primarily comprise strategic vision, strategic objectives, strategic tasks, strategic priorities, and implementation measures, which respectively answer the questions of where the GHMGBA construction is heading, how to get there, what to do, and how to execute specifically. The strategic vision is a conceptual system abstracted and condensed based on elements such as the GHMGBA's positioning and functions, reflecting the main development direction of the GHMGBA over a considerable historical period. Strategic objectives elaborate and specify the strategic vision, clarifying the phased development level of GHMGBA construction and serving as an "attractor center" that guides practical behavior to continuously approach the objectives. Strategic tasks represent further decomposition of strategic objectives, as strategic objectives can only be achieved through the completion of strategic tasks. Strategic priorities constitute the decisive components of strategic tasks and are critical links related to whether overall strategic objectives can be realized. Strategic execution reflects the series of implementation measures that should be deployed to complete strategic tasks, demonstrating how implementing subjects, guided by vision and objectives, act upon the development of the GHMGBA overall system through various means or measures to produce purposeful changes. The structural relationship among strategic vision, objectives, tasks, priorities, and execution is one of mutual connection, interlocking progression, and step-by-step advancement. Through top-down and bottom-up linkage mechanisms, vision and capabilities are tightly connected to guide and promote GHMGBA construction toward the established ideal direction.

[Figure 1: see original paper]

1.3 The “He Organization” Role of Strategic Systems in Urban System Development and Evolution

The strategic system is an important subsystem within the urban system that plays a significant “he organization” (externally organized) role in the development and evolution of urban systems. In self-organization theory, the formation and evolution of things can be divided into two forms: self-organization and he-organization. Self-organization refers to spontaneous evolution without specific external intervention, with organizational forces primarily originating from within the thing itself (such as life growth), whereas he-organization refers to evolution under specific external intervention, with organizational forces coming from outside the thing (such as machines). For the evolutionary development of urban systems, both self-organization and he-organization play important roles. That is, the overall urban system and the entire historical process of its development and evolution are fundamentally self-organized. However, for certain local components (such as urban spatial planning) and certain specific development periods (such as post-disaster reconstruction), urban development exhibits phenomena dominated by he-organization. Urban development strategy primarily focuses on forward-looking, regional, strategic, and framework issues that will significantly impact future urban development, playing an important he-organization role in urban system development and evolution by connecting urban development vision, objectives, tasks, and implementation measures to guide the urban system toward a predetermined development direction. From the perspective of system metaphors, the neural control metaphor can be used to understand and analyze urban systems, with the strategic system being the core that enables the urban system to form a control system, playing the role of a “standard control model” to guide and control the urban system toward a predetermined direction.

2 Analysis of Elements and Structure of the GHMGBA Strategic System

Based on the theoretical analysis of strategic system elements and structure, this paper delineates the elements and structure of the GHMGBA strategic system, as specifically shown in [Figure 2: see original paper]. The following sections provide detailed analysis of the different elements within the GHMGBA strategic system and their structural relationships.

[Figure 2: see original paper]

2.1 Strategic Vision, Objectives, and Tasks for GHMGBA Construction

Strategic vision reflects the basic development direction for a relatively long future period. Based on the strategic functions the GHMGBA undertakes for the nation and its own future development needs, the GHMGBA’s future development direction is to build a world-class urban agglomeration and a world-

class economic bay area. This overall direction can be decomposed into specific development directions in several fields such as economy, society, culture, and ecology, including a global science and technology innovation center, the world's most economically dynamic region, a world-renowned high-quality living area, and a highland for global cultural exchange and mutual learning. To formulate strategic objectives and tasks, it is first necessary to analyze from multiple perspectives how these visions should be realized. For example, examining the development history of the GHMGBA reveals that Guangdong-Hong Kong-Macao cooperation has been most fundamentally manifested in economic cooperation, having experienced three development stages: the "front shop, back factory" stage (1978–2000), the service industry-centered economic integration stage (2001–2013), and the macroeconomics-oriented comprehensive regional integration stage (2014–present). To establish the GHMGBA as the world's most economically dynamic region, this vision's realization includes establishing a global science and technology innovation center, building a modern industrial system with collaborative Guangdong-Hong Kong-Macao development, achieving liberalization of trade in services among Guangdong, Hong Kong, and Macao, and creating a financial core circle in the Greater Bay Area. Simultaneously, the efficient operation and development of the bay area economy require support from interconnected, efficient, and smooth infrastructure and major cooperation platforms among the three regions, while also giving overall consideration to spatial planning, land use, industrial layout, and ecological environmental protection in the Greater Bay Area. Similarly, creating a high-quality living circle in the GHMGBA involves integration and cooperation among the three regions in medical care, education, elderly care, and innovation and entrepreneurship services, which also relies on support from efficient and convenient transportation networks, high-speed interconnected information networks, and livable ecological environments. Corresponding to the realization of the strategic vision, the strategic objectives and tasks for GHMGBA construction are mainly reflected in economic development, social development, infrastructure construction, cooperation platform construction, spatial structure planning, and environmental protection and ecological construction. The formulation of strategic objectives and tasks should be comprehensively determined based on analysis of the GHMGBA's external development environment, internal development status, and resource capacity conditions, centered on the above aspects.

2.2 Strategic Priorities for GHMGBA Construction

Achieving "interconnectivity" and collaborative cooperation among Guangdong, Hong Kong, and Macao from infrastructure to institutional policies and then to economic and social development constitutes the focus of GHMGBA construction. Interconnectivity represents a new direction for globalization and a new orientation for large-scale and sub-regional cooperation. Because the GHMGBA is located within a heterogeneous urban agglomeration characterized by "two systems, three customs territories, and three legal systems," significant differences exist among the political systems, administrative systems, and legal sys-

tems of the three regions. Therefore, one of the strategic priorities for building the GHMGBA world-class urban agglomeration and world-class economic bay area is to achieve institutional, policy, legal, and regulatory alignment among Guangdong, Hong Kong, and Macao, clearing institutional and legal obstacles for further effective regional integration. Following the “front shop, back factory” cooperation model based primarily on resource factor docking, Hong Kong’s industrial structure has further financialized and become more virtual, while Guangdong urgently needs to promote industrial transformation and upgrading by developing advanced manufacturing and modern service industries. However, due to Hong Kong’s lack of relevant industrial development experience and direct resources, the complementarity of traditional industrial cooperation between Guangdong and Hong Kong has gradually declined. Consequently, cooperation among Guangdong, Hong Kong, and Macao needs to move toward mid-to-high-end industrial chain cooperation to jointly create new international competitive advantages. Another strategic priority for GHMGBA construction is to further advance the depth and density of cooperation among the three regions on the basis of achieving institutional, policy, legal, and regulatory alignment, by comprehensively and deeply carrying out cooperation in finance, trade, industry, technological innovation, education, residence, elderly care, and other aspects to promote complementary advantages and resource integration among the three regions.

The advancement of strategic priorities can be divided into two phases. The first phase is the cooperation infrastructure construction and improvement period, which effectively clears cooperation channels among Guangdong, Hong Kong, and Macao from both hardware and software perspectives to achieve smooth and efficient flows of people, goods, capital, and information among the three regions, thereby laying a comprehensive foundation for trilateral cooperation. The hardware aspect involves promoting the construction of transportation and information infrastructure among the three regions to build a comprehensive transportation system radiating both domestically and internationally, known as “one center, three networks” (“one center” refers to a world-class international shipping and logistics center, while “three networks” refer to multi-directional channel networks, sea and air route networks, and rapid transit networks). Simultaneously, it promotes information technology cooperation among Guangdong, Hong Kong, and Macao in cloud computing, big data, the Internet of Things, and artificial intelligence to accelerate the construction of an international information port, forming an infrastructure system adapted to regional economic and social development. The software aspect primarily involves achieving effective institutional, policy, legal, and regulatory alignment among Guangdong, Hong Kong, and Macao to dismantle tangible and intangible barriers that hinder deeper cooperation and to jointly plan future development. On July 1, 2017, the National Development and Reform Commission and the governments of Guangdong, Hong Kong, and Macao signed the Framework Agreement on Deepening Guangdong-Hong Kong-Macao Cooperation and Promoting the Development of the Greater Bay Area (hereinafter referred to as the Framework

Agreement), proposing to formulate the Development Plan for Guangdong-Hong Kong-Macao Greater Bay Area Urban Agglomeration. The four parties agreed to hold regular consultation meetings annually to propose annual key tasks for promoting GHMGBA construction, initially establishing the basic framework and mechanisms for trilateral cooperation. The second phase of strategic priorities is to achieve comprehensive and deepening cooperation in economic and social development among Guangdong, Hong Kong, and Macao. Specifically, in industrial development, gradually build a modern industrial system with collaborative development, improve the industrial development pattern, and accelerate the move toward the high end of the global value chain. In trade development, promote two-way opening and market access between Hong Kong, Macao, and the mainland by introducing negative lists and pre-establishment national treatment systems to achieve internal marketization between Guangdong and Hong Kong and Macao in the service sector. In financial development, promote orderly competition and collaborative development of finance in Guangdong, Hong Kong, and Macao to build a Greater Bay Area financial core circle with Hong Kong as the leader, Guangzhou, Shenzhen, Macao, and Zhuhai as the support, and Nansha, Qianhai, and Hengqin as the nodes. In technological innovation, continuously improve the institutional mechanisms for Guangdong-Hong Kong-Macao scientific and technological innovation cooperation, build a GHMGBA innovation community, and gradually establish a globally important science and technology industry innovation center. In building a high-quality living circle, focus on improving social livelihoods through cooperation and sharing in internationalized education, innovation and entrepreneurship services, and medical services, as well as collaborative governance, to build the GHMGBA into a green, livable, business-friendly, and tourist-friendly world-class urban agglomeration.

2.3 Strategic Implementation for GHMGBA Construction

Strategic implementation refers to the relevant execution and safeguard measures that should be deployed to put strategic tasks into practice, mainly including implementing bodies and supporting measures. Regarding implementing bodies, the cooperative development of the GHMGBA involves collaboration under the framework of “one country, two systems, three customs territories, and four core cities,” encompassing multiple different systems including special administrative regions and free ports (Hong Kong and Macao), special economic zones (Shenzhen and Zhuhai), and pilot free trade zones (Nansha, Qianhai Shekou, and Hengqin). Many authorities for policy coordination among the three regions fall under central government departments, leaving limited scope for independent trilateral consultation. Therefore, the development of the GHMGBA requires participation and leadership at the central level. China has already established a Central Leading Group for GHMGBA construction at the central level to coordinate and study solutions to major issues in the bay area’s cooperative development. Due to regional differences arising from the “two systems,” cross-border regional cooperation faces certain barriers and obstacles. Consequently, in addition to establishing a central-level working leading group,

the GHMGBA construction should also establish and improve corresponding coordination mechanisms. To promote coordination among Guangdong, Hong Kong, and Macao, based on the annual “Guangdong-Hong Kong Cooperation Joint Conference” and “Guangdong-Macao Cooperation Joint Conference” established in 1998 and 2003 respectively, the Framework Agreement proposes that the National Development and Reform Commission, Guangdong, Hong Kong, and Macao jointly formulate and implement the Development Plan for Guangdong-Hong Kong-Macao Greater Bay Area Urban Agglomeration, with the four parties holding regular consultation meetings annually to coordinate and resolve major issues and cooperation matters in the bay area’s development. Meanwhile, the governments of Guangdong, Hong Kong, and Macao have jointly established a daily working mechanism for promoting GHMGBA development, respectively located in the Guangdong Provincial Development and Reform Commission, the Constitutional and Mainland Affairs Bureau of the Hong Kong SAR Government, and the Office of the Chief Executive of the Macao SAR Government, to play a coordinating and liaison role in cooperation during daily operations and promote the deep implementation of the Development Plan for Guangdong-Hong Kong-Macao Greater Bay Area Urban Agglomeration.

Regarding supporting measures, corresponding support should be provided in policy, institutions, laws and regulations, funding, talent, and publicity. For a long time, Hong Kong has not had a comprehensive development strategic plan, and existing related plans have focused primarily on Hong Kong’s own development, remaining relatively passive in cross-border planning and cooperation with national strategies. The primary task in promoting cooperation among Guangdong, Hong Kong, and Macao is to actively promote innovation in policies, institutions, laws, and regulations among the three regions, strengthen their alignment and cooperation, and achieve coordination of policies, institutions, and plans between Hong Kong and Guangdong and Macao, thereby clearing institutional obstacles for trilateral cooperation. Additionally, the central and three regional governments should increase financial investment in GHMGBA construction projects, focusing on supporting infrastructure, industrial upgrading, innovation and entrepreneurship, medical care and education, and ecological environmental protection projects in the GHMGBA, while promoting innovation in project financing methods to attract and encourage private capital to invest in project construction. Regarding talent, on the one hand, strengthen the introduction and cultivation of scientific and technological innovation talent, gather first-class international innovative talent, and lay the foundation for building the GHMGBA into an international science and technology innovation center. On the other hand, absorb representatives and experts from all sectors in the mainland and Hong Kong and Macao to participate in studying and discussing cooperation and development strategies, methods, and issues in various fields to contribute ideas and suggestions for GHMGBA construction. Strengthen publicity and promotion to fully absorb talents from industrial and commercial enterprises, labor unions, professional services, academia, and other

social sectors to deepen exchanges and cooperation, enabling them to jointly participate in GHMGBA construction.

3 Research on the Operating Mechanism of the GHMGBA Strategic System

The construction of the GHMGBA as a world-class urban agglomeration and world-class bay area is a complex systematic project involving coordinated development across multiple domains including regional and urban economy, society, ecology, and space. If the GHMGBA is viewed as an overall system, this overall system is composed of different subsystems playing different roles. Combining Boulding' s hierarchical classification of systems based on complexity and P. Checkland' s classification of human activity systems and human-constructed abstract systems, we conceptualize the GHMGBA overall system as comprising three categories of systems with increasing complexity, summarized as three layers: the physical layer, the activity layer, and the strategic layer. The physical layer is the structural level formed by relevant material elements and their physical forms in GHMGBA construction, including two subsystems—the support system and the spatial system—primarily manifested as interconnected infrastructure and networked spatial structures. The activity layer is a system level higher than the physical layer, reflecting the forms of people' s economic and social activities. It includes two subsystems—the social system and the economic system—primarily manifested as a livable, business-friendly, and tourist-friendly high-quality living circle and a world-class economic growth pole. The emergent characteristics of the activity layer over the physical layer are manifested in that, relying on the material carriers and venues provided by the physical layer, people with cognitive, judgment, decision-making, and action capabilities evolve diverse innovative forms of economic and social activities at the activity layer. The strategic layer is a system level higher than the activity layer, composed of the strategic system oriented toward building a world-class urban agglomeration and world-class bay area. The emergent characteristics of the strategic layer over the activity layer are manifested in that it fully leverages human subjective initiative to depict a beautiful future vision for the GHMGBA and guides and coordinates people' s economic and social activities through formulating and implementing corresponding strategic plans to translate this vision into practice. The strategic system, social system, economic system, support system, and spatial system are interrelated and interact with each other to collectively form the GHMGBA overall system, as shown in [Figure 3: see original paper]. For an urban agglomeration system, it is not merely a collection of cities. Only when the “group” achieves integrated industrial development and layout, integrated infrastructure construction, and integrated urban-rural coordination, with clear positioning of each urban unit, rational division of labor, functional matching, complementary advantages, and mutual benefits, can the “urban agglomeration” transcend being merely a collection of cities.

[Figure 3: see original paper]

The “he organization” role played by the strategic system in GHMGBA construction and development is primarily realized through functions such as planning, organizing, guiding, controlling, and coordinating. The strategic system integrates the interconnected and interacting economic, social, environmental, spatial, and other factors in GHMGBA construction from a holistic and global perspective, formulating the strategic vision, objectives, tasks, and priorities for GHMGBA urban agglomeration system construction, and concretely implementing them in the development of the social, economic, support, and spatial systems to point out the direction and path for GHMGBA world-class urban agglomeration construction and development. Under the organizational leadership of the GHMGBA Leading Group and with support from corresponding coordination mechanisms, institutions, policies, regulations, funding, and talent, the strategic system promotes the social, economic, support, and spatial systems to develop in predetermined directions and guides and controls the coordinated and balanced development of the four systems. Meanwhile, the planning and implementation mechanisms within the strategic system continuously adjust and update based on the achievement degree of objectives and tasks in GHMGBA construction to maintain the vitality of the strategic system.

As a major national and regional development strategy, the GHMGBA’ s future development direction is to build a world-class urban agglomeration and a world-class economic bay area. Faced with this beautiful development vision, what aspects should GHMGBA construction focus on, and how should its development plan be formulated and effectively implemented? From a holistic and global perspective on GHMGBA construction, the strategic system expands and subdivides the strategic vision into different strategic objectives from multiple dimensions including economy, society, space, ecology, and infrastructure, further decomposes strategic objectives into different strategic tasks, and identifies the alignment of institutions, policies, laws, and regulations among Guangdong, Hong Kong, and Macao, as well as the depth and density of internal connections and cooperation within the Greater Bay Area, as strategic priorities. Under the leadership of the implementing body—the GHMGBA Leading Group—and with support from safeguard elements such as corresponding institutions, policies, funding, and talent, the strategic system comprehensively promotes the GHMGBA toward becoming a world-class urban agglomeration and a world-class economic bay area. Within the GHMGBA overall system, the strategic system plays an important “he organization” role by guiding and controlling the development of the social, economic, support, and spatial systems through its planning, organizing, guiding, controlling, and coordinating functions, thereby promoting the comprehensive realization of the grand strategic objective of building a world-class urban agglomeration and a world-class economic bay area.

References

- [1] Wang Xingping. Urban corporatization and urban strategic planning[J]. City Planning Review, 2002, 26(6): 69-72, 96.

- [2] Yang Zhen. Enlightenment of corporate strategy on urban strategy formulation[J]. Urban Development Studies, 2002, 9(3): 30-35.
- [3] Chen Dingrong, Jiang Ling, Cheng Maoji. New thinking in urban strategic research during the transition period[J]. City Planning Review, 2011(S1): 148-151.
- [4] Miao Dongsheng. Self-organization and re-organization[J]. Journal of Renmin University of China, 1988(4): 67-70.
- [5] He Yue. New theory of self-organizing cities[D]. Taiyuan: Doctoral dissertation of Shanxi University, 2012.
- [6] Yang Jianmei. System metaphor, system methodology system, and total systems intervention[J]. Systems Engineering, 2000, 18(2): 7-12.
- [7] China Index Academy. GDP approaching that of New York Bay Area: The era of Guangdong-Hong Kong-Macao Greater Bay Area is coming[EB/OL]. [2018-03-10]. <http://news.fang.com/open/25358270.html>.
- [8] Qiu Shan. Dimensional analysis of development direction selection for Guangdong-Hong Kong-Macao Greater Bay Area urban agglomeration[J]. Guangdong Social Sciences, 2017(4): 15-20.
- [9] Cai Chimeng. Strategic significance and practical challenges of Guangdong-Hong Kong-Macao Greater Bay Area urban agglomeration construction[J]. Guangdong Social Sciences, 2017(4): 5-14, 254.
- [10] Pan-Pearl River Delta Cooperation Information Network. Framework Agreement on Deepening Guangdong-Hong Kong-Macao Cooperation and Promoting the Development of the Greater Bay Area[EB/OL]. [2017-03-10]. http://www.pprd.org.cn/fzgz/hzgh/201707/t20170704_460601.htm, 2017-07-04.
- [11] (UK) P. Checkland. Systems Thinking, Systems Practice[M]. Translated by Zuo Xiaosi, et al. Beijing: Huaxia Publishing House, 1990: 139-154.
- [12] Zhang Zhengang, Zhang Xiaojuan. Research on the five-dimensional model of smart cities[J]. China Science and Technology Forum, 2014(11): 41-45, 75.
- [13] Fang Chuanglin. Important progress and future development direction of urban agglomeration research in China[J]. Acta Geographica Sinica, 2014, 69(8): 1130-1144.
- [14] Zhang Huaxia. Material System Theory[M]. Hangzhou: Zhejiang People's Publishing House, 1987: 264.

Author Contributions

Zhang Xiaojuan: Perspective selection, analysis, and writing;
Jia Haiwei: Overall conceptualization of the article.

Note: Figure translations are in progress. See original paper for figures.

Source: ChinaXiv – Machine translation. Verify with original.