

Cross-border planning and governance based on climate resilience:

Take the example of the blue-green space in the Guangdong- Hong Kong-Macao Greater Bay Area

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Abstract

Through an analysis of regional policies, texts and practices, this paper presents the cross-border planning and governance interactions among multiple levels of governments in the Guangdong-Hong Kong-Macao Greater Bay Area in the context of extreme climate crises, targeting ecological restoration of blue and green spaces and the construction of ecologically resilient spaces for disaster prevention. We noted that in integrating multiple objectives and spatial scales, cross-border spatial planning and multi-level governance helped facilitate joint planning collaboration among city governments across city boundaries. In addition, flexible governance tools such as the establishment of joint government meetings, regional cooperation agreements and the formation of diverse expert consultations can address to some extent the boundary impediments posed by cross-government, cross-sector, cross-level and cross-discipline. Although a variety of plans and measures have been promoted within the Greater Bay Area, there are problems with the management of ecological units not breaking through boundary constraints and the differences in the effectiveness of collaborative governance between city governments.

Keywords

Climate resilience, Blue-green spatial resilience, Cross-border spatial planning, Multi-level governance, Guangdong-Hong Kong-Macao Greater Bay Area

1. Introduction

Climate change has become an important factor affecting global sustainable development. Climate adaptation planning is the process of establishing a coupling relationship between planning control elements and urban climate conditions, finding the inherent patterns and mechanisms of interaction, improving urban resilience, mitigating and adapting to climate change, and providing guidelines for countermeasures and measures to develop urban development and construction activities that are compatible with the urban climate environment (IPCC, 2007). In New York, Hong Kong, Paris, Rotterdam, London, Vancouver and Melbourne, policies and research on the topic of urban climate resilience have increased since the beginning of the 21st century to guide local spatial planning and urban development in response to droughts, heat waves and flooding from heavy rainfall. Among these, the rational use of blue-green space in the built environment has become one of the key planning tools to address climate change by managing, protecting and restoring it to assist people in adapting to the adverse impacts of climate change (Geneletti, et. al., 2016) (Table 1), while the adaptation (EBA) discussions arising from ecological infrastructure are also gaining attention.

EBA measures	Ecosystem services management
Ensure ventilation from cooler areas outside the city	Climate regulation
Promote green roofs and three-dimensional greening	Climate regulation, flood regulation, recreation, aesthetic value, food production, carbon sequestration, etc.
Increase the total amount of green space in the city	Climate regulation, flood regulation, recreation, aesthetic values, sense of place, mental health, nature education, carbon sequestration, oxygen production, etc.
Reduction of impermeable surfaces	Climate regulation, flood regulation, recreation, aesthetic value, sense of place, mental health, nature education, carbon sequestration, etc.
The re-naturalization of rivers	Flood regulation, water circulation, recreation, nature education, sense of place, etc.
Facilitating the shift from blue-green infrastructure to stormwater management	Flood regulation, recreation, aesthetic value, sense of place, mental health, nature education, carbon sequestration, etc.
Promoting vegetation applications adapted to local climates	Climate regulation, flood regulation, recreation, aesthetic value, sense of place, mental health, nature education, carbon sequestration, etc.

Table 1 . Examples of relevant planning documents of European cities referring to EBA measures. Source: Drawn by the author

Since 2013, the Chinese government has issued documents such as the "National Climate Change Adaptation Strategy (2013) " and the "Urban Climate Adaptation Action Plan (2016) ", which emphasize scientific analysis of the main issues and impacts of climate change and full consideration of climate change factors in urban planning. At the practical level, domestic practices, mainly "Sponge Cities", reflect the optimization of the resilience of blue and green spaces, transforming and broadening the perspective of planning and design, with quantitative indicators related to blue and green spaces beginning to be incorporated into the urban planning system, and the paradigm of blue and green space planning based on climate adaptation is being changed and optimized in China.

Blue-green space has been widely recognized as an effective means of mitigating the heat island effect. With functions such as cooling, noise reduction and reducing evaporation from water bodies, blue-green space can improve the urban heat island effect and enhance urban climate resilience. At the same time, blue-green space can also alleviate problems such as urban flooding and water shortage, improve the stability of the urban water cycle system and enhance the climate adaptation of cities. Numerous studies have shown that green space has a significant negative correlation with temperature, while effectively reducing surrounding temperatures and creating a 'cold island effect' (Zhao, et al., 2019).The extent to which blue-green space ecosystems alter microclimate and local climate varies across scales, with many studies focusing on the microclimate alteration of urban blue-green space at the urban scale (Yu, Zhaowu, et al.,2020). However, it should not be overlooked that blue-green spaces do not exist independently, but are networked and continuous, which can have an impact on the wider region. The Netherlands, a pioneering practice, has focused on integrating water management and spatial planning, emphasizing the 'promotion of water management and spatial integration' (WHITE I,et al,2016), through the

establishment of a Delta Commission and the 'Delta Programme, which integrates blue space management at the territorial scale and emphasizes watersheds across the administrative boundaries of cities (Meng, 2021; ABROWSKI M., 2018). The New York Bay Area Plan gives us a nature-based transboundary ecological design perspective by simulating different scenarios of flooding, coordinating the continuity of building blue-green spaces across cities in the Bay Area, and forming a governance framework for cross-city cooperation (FRANCESCH-HUIDOBRO M, et. al.,2017). It is evident that cross-border blue-green spatial planning collaboration at the regional level plays a role at a larger scale.

In recent years, China has similarly focused on the issue of blue-green spatial resilience at the regional level. The Guangdong-Hong Kong-Macao Greater Bay Area (GBA), one of China's most open and economically developed regions, is at the forefront of China's exploration of cross-border governance, covering four highly developed core cities - Hong Kong, Macau, Guangzhou and Shenzhen - as well as the prefecture-level cities of Zhaoqing, Dongguan, Zhuhai, Zhongshan and Foshan, formerly known as the Pearl River Delta region. Due to the political framework of "One country, Two systems", Hong Kong and Macau, as Special Administrative Regions of the country, enjoy a high degree of autonomy and are similar to the provincial level of China in terms of administrative level. The Guangdong-Hong Kong-Macao Greater Bay Area (GBA) is therefore a market-driven economic system comprising Guangdong Province (Also known as the Mainland government) and the Hong Kong and Macau Special Administrative Regions. Due to the rise in overall urbanization levels within the GBA, impervious areas and urban built-up areas are spreading rapidly, reaching 16.4% in 2017, and the heat island effect in cities is becoming more pronounced (Yang, et al. 2019). In this scenario, Guangzhou is used as an example to implement the "Cool City" initiative at the city level. The WRF simulation study was introduced in Guangzhou's spatial planning, and six major ventilation corridors in the city were constructed in conjunction with the layout of open spaces such as urban rivers and green areas, to improve the urban microclimate with the concept of natural ventilation and to realize the vision of a cool city. Regional collaboration across cities, borders, systems and sectors is far more difficult than city governments, and each city government has its own management boundaries that make it difficult to step outside of specific spatial constraints. Relying on administrative restructuring, policies and statutory planning is clearly unable to achieve good governance, which highlights the need to explore the use of flexible tools to achieve regional cross-border collaboration (Makkonen, et al. 2016).

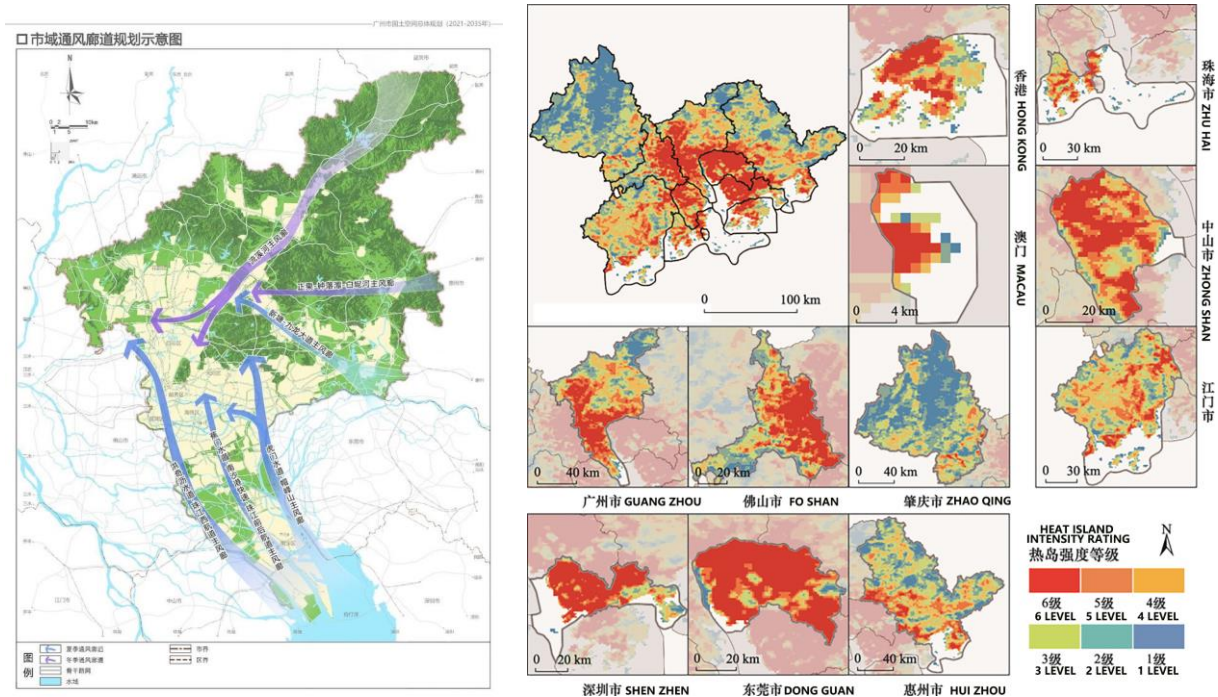


Figure 1. Guangzhou's "Cool City" plan based on climate adaptation (left) & the heat island effect in the Guangdong-Hong Kong-Macao Greater Bay Area (right). Source: Spatial pattern of urban heat island and multivariate modeling of impact factors in the Guangdong-Hong Kong-Macao Greater Bay area

2. Methodology

This study will describe the process of governance and collaboration on blue-green space and ecology between nine mainland cities from the Pearl River Delta to the Guangdong-Hong Kong-Macao Greater Bay Area and the Hong Kong and Macao Special Administrative Regions. The study will analyse how China has collaborated and governed regional blue-green spaces across borders under the special policy of "one country, two systems". In this process, this study will apply the method of semantic analysis to existing policy documents and planning texts by time period, and provide a systematic account of the existing cases of cross-border practices. This study finds that the flexible model of cross-border collaborative governance and planning adopted by the governments of Guangdong, Hong Kong and Macao has Chinese characteristics (Wang, S. F., et al., 2023).

3. Collaborative Ecological Soft Governance Practices in the GBA

3.1 Constructing a multi-level governance

In the context of special administrative regions, the Central Government has granted Hong Kong and Macao Special Administrative Regions a high degree of autonomy far beyond that of other regions in terms of scope and extent (Dong Ha, 2022). As the systems of Hong Kong and Macao are different from those of the Mainland, it is decided that cross-border cooperation among Guangdong, Hong Kong and Macao can only be carried out in a soft governance manner. After a 30-year-long history of cooperation, a multi-level organizational structure covering both formal and informal aspects has now been formed in the face of regional water bodies, green areas, air pollution and ecological protection. It contains two specific components:

Establishment of the Guangdong-Hong Kong-Macao Joint Conference as a consultation mechanism. Starting with the establishment of the Hong Kong/Guangdong Joint Conference proposed by the former

Chief Executive of the HKSAR in 1998, the official cooperation among Guangdong, Hong Kong and Macao has entered a substantive stage since 2003 with the signing of the “Framework Agreement on Hong Kong/Guangdong Cooperation” and the “Framework Agreement on Macao/Guangdong Cooperation” (Chen Guanghan, et al., 2012). The Guangdong-Hong Kong-Macao Joint Conference includes the governors and chief executives of Guangdong Province, Macau and Hong Kong, as well as subordinate task forces covering multiple functions and special groups, which conduct regular meetings to jointly study and decide on relevant cooperation projects and matters, strengthen the coordination and implementation functions, and establish or adjust the cooperation task forces. The Joint Conference is a high-profile leadership body that has effectively promoted the progress of environmental governance in the Guangdong-Hong Kong-Macao Greater Bay Area.

Establishment of a blue-green space governance group responsible for specific implementation. Regional environmental protection for blue and green spaces began in the 1990s, with the Hong Kong-Guangdong Environmental Protection Liaison Group (renamed the Hong Kong-Guangdong Joint Working Group on Sustainable Development and Environmental Protection after 2000) and the Hong Kong-Guangdong Environmental Protection Co-operation liaison group established in the 1990s as the main platforms for environmental protection exchanges and co-operation between Hong Kong, Guangdong and Macao. Apart from the participation of government departments, these formal organization also involve relevant professionals and their issues are not limited to the protection of blue and green spaces. In particular, the Hong Kong-Guangdong Sustainable Development and Environmental Protection Cooperation Group has an expert panel and seven thematic (specialists) groups, with the Director of the Guangdong Environmental Protection Department and the Secretary for the Environment of Hong Kong as the dual chairpersons, and also involves a number of government units from Guangdong and Hong Kong. The cooperation group is mainly responsible for the policy formulation and management of blue-green governance in Guangdong and Hong Kong, consultation on cross-border planning issues faced, and exchange of environmental data between the two places (Wu, Lei, et al., 2016). In addition, the Guangdong-Macao Environmental Co-operation liaison group was established in 2000 to operate under a similar structure, and has four thematic groups, including the Forestry and Conservation Task Force, the Air Management Co-operation Task Force, and the Water Gourd Control Task Force. Between 2002 and 2006 there was an exchange of content involving cross-border water and Water hyacinth pollution management, emergency response and ecological protection technology exchange, and environmental protection (Gu Chunting, 2017).

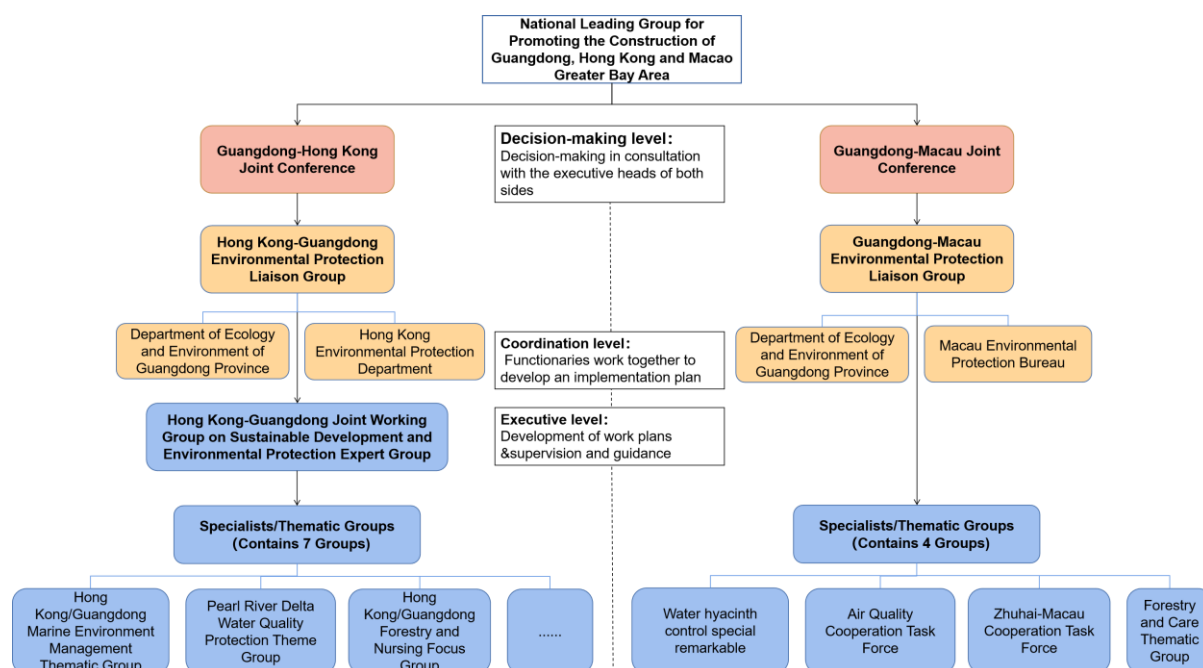


Figure 2. Multi-Level Governance Framework for Guangdong, Hong Kong and Macau. Source: Drawn by the author

3.2 Co-production of blue-green cross-border spatial planning

The history of cooperation between Guangdong, Hong Kong and Macao can be traced back to the late 19th and early 20th centuries, when the British Hong Kong Government and the Qing Government collaborated on the development of Sha Tau Kok and the construction of the Guangzhou-Kowloon railway line, as well as the Guangdong-Macao and Guangdong-Hong Kong water supply projects. However, it was not until 2006 that, with the agreement of the Hong Kong and Macao Affairs Office of the State Council and the governments of Guangdong, Hong Kong and Macao, the Guangdong Provincial Department of Housing and Construction, the Hong Kong Development Bureau and the Macao Department of Transport and Public Works, under the framework of "One country, Two systems", through the two co-operation platforms of the Hong Kong/Guangdong Town Planning and Development Task Force and the Guangdong-Macao Town Planning and Development Task Force, conducted the first strategic The study has jointly formulated a strategic regional plan, the "Planning Study on the Co-ordinated Development of the Greater Pearl River Delta Townships". The planning study includes the theme of regional ecological protection. Based on the large-scale and high-intensity development and construction in the Greater Pearl River Delta region, the inter-city green space and development space are gradually fragmented, which seriously threatens the regional ecological environment, Green belts, lakes and water systems, accelerate the construction of regional basket networks (water networks) and green networks, and delineate ecologically fragile buffer areas to form a good blue-green spatial layout for the urban agglomerations.

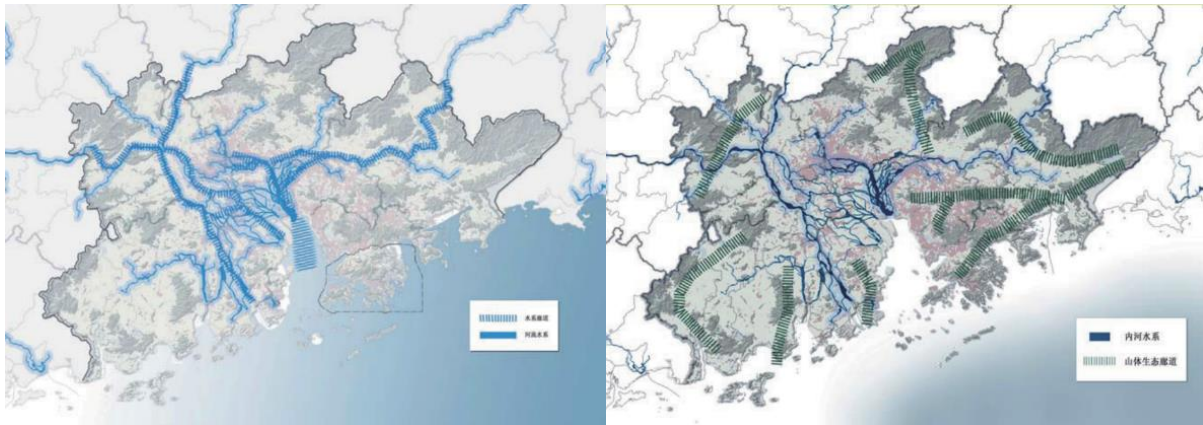


Figure 3. Planning for the Construction of Water and Mountain Ecological Corridors in the Greater PRD Townships. Source: Planning Study on the Coordinated Development of the Greater Pearl River Delta Townships

Based on the 2006 study, “The Action Plan For Livable Bay Area of the Peral River Estuary” was jointly organized by the Guangdong Provincial Department of Housing and Urban-Rural Development, the Hong Kong Planning Department and the Macao Department of Transport and Public Works in 2010. It covers Guangzhou, Shenzhen, Dongguan, Zhongshan, Zhuhai and the Hong Kong and Macao Special Administrative Regions. The Action Plan starts from the assessment of the current situation, explores the problems of the current blue and green space, proposes to improve the regional ventilation and alleviate the urban heat island effect through the "Green Network" and "Blue Network" in coordination and cooperation among Guangdong, Hong Kong and Macao. The Action Plan also includes recommendations for cross-border environmental cooperation, including (1) To conserve the forest, wetland and marine ecosystems in the region with a view to protecting their integrity and sustainability; and forest/country parks, wetland parks and marine parks should be established at appropriate areas to enhance conservation;(2) Guangdong, Hong Kong and Macao to consider establishing aligned ecological corridors spanning across the boundaries 2 to coordinate conservation work in the same natural ecosystem;(3) The five PRD cities to extend their existing greenway networks; Hong Kong to explore the long term feasibility of extending the existing networks of mountain trails, cycle tracks, hiking trails and walking trails to the areas released from the previous boundary closed area; Macao to expedite the provision of seafront green promenades in suitable areas.(4) The coastal resources of the Bay Area should be improved. The natural coastlines including beaches, waterfront forest belts and wildlife habitats should be protected. The civic waterfront should be improved by adding more waterfront public activities, and the industrial waterfront should be revamped and beautified.

The preparation of the Action Plan took four years, with two rounds of public consultation activities, in addition to listening to the views of government departments and experts from the three places. The final outcome was completed at the end of 2014 after consideration by the governments of Guangdong, Hong Kong and Macao in accordance with their respective procedures (Ma Xiangming, et al., 2019).



Figure 4. Indicative Plan of the “Blue Network” and “Green Network” of the Bay Area. Source: The Action Plan For Livable Bay Area of the Peral River Estuary

3.3 Diversified cross-border environmental management agreement signed

The signing of pluralistic governance agreements as a guarantee for achieving cross-border cooperation is used by most countries for inter-country or inter-city cooperation. In the GBA, there are two specific scenarios:

From Guangdong Province, Hong Kong and Macao Special Administrative Regions on water environment, green space construction and natural resources. In 2009, Guangdong and Hong Kong signed the "Guangdong-Hong Kong Environmental Protection Cooperation Agreement", with areas of cooperation including air pollution prevention and control, water environmental protection and forestry conservation. In 2013, Zhuhai-Macao jointly signed the "Zhuhai-Macao Environmental Protection Cooperation Agreement". In July 2017, the National Development and Reform Commission and Guangdong, Hong Kong and Macao jointly signed the "Framework Agreement on Deepening Cooperation among Guangdong, Hong Kong and Macao" to Promote the Construction of the GBA, which clearly states that ecological priority and green development should be listed as important cooperation principles, improve the cooperation mechanism for ecological construction and environmental protection, and build a green and low-carbon bay area. In 2018, saw the joint construction of the GBA Environmental Laboratory by relevant higher education institutions in Guangdong, Hong Kong and Macao, which marked the cooperation among Guangdong, Hong Kong and Macao in ecological environmental protection. The mechanism has been further deepened.

Cooperation agreements between 9 cities from within Guangdong Province. Most of these agreements were conducted in the Guangzhou metropolitan area (covering Guangzhou, Foshan and Zhaoqing), Shenzhen metropolitan area (covering Shenzhen, Dongguan and Huizhou) and Zhuhai-West metropolitan area (covering Zhuhai, Zhongshan and Jiangmen). They include the "Shenzhen-Dongguan-Huizhou Environmental Protection" and "Ecological Construction Cooperation Agreement", the "Guangfo-Zhao Economic Circle Ecological and Environmental Protection Cooperation Agreement", and the "Zhuhai-Zhongjiang Environmental Protection Regional Cooperation Agreement". These environmental cooperation agreements focus on water and air environment management and involve planning, joint project review, joint monitoring, environmental scientific research, environmental facilities, publicity and cooperation, as well as emergency linkage, information sharing, industrial cooperation, cooperation

mechanisms The project also covers various aspects such as emergency response, information sharing, industrial cooperation and cooperation mechanisms. In addition, there are also cooperation agreements for transboundary water pollution, including the 2009 “Agreement on Comprehensive Management of the Shenzhen-Dongguan-Huizhou Boundary River and Cross-border Rivers” signed by Shenzhen, Dongguan and Huizhou to jointly manage the pollution of the Shima River, the Danshui River, the Maozhou River and the Sha River, among other transboundary rivers.

3.4 Joint blue-green space cooperation project

1) Cross-border water environment management

Cross-border water environment management is an important part of the Guangdong-Hong Kong-Macao Blue-Green Space Cooperation Project, which mainly involves research and cooperation in the management of cross-border rivers and the near-shore waters of the Pearl River Estuary. The water environment management of GBA is mainly divided into the management of the boundary rivers between Shenzhen-Hong Kong, Zhuhai-Macao, including the Shenzhen River on the boundary between Shenzhen-Hong Kong, and the Duck Chung River and Qianshan River on the boundary between Zhuhai-Macao. The Shenzhen River is 37 kilometers long, with Shenzhen on the north bank accounting for 60% of the watershed area and Hong Kong 40%. Negotiations between the Hong Kong and British governments and Shenzhen were launched as early as December 1981, and a joint team was set up in 1982 to carry out the preparation of a preliminary plan for the management of the Shenzhen River and the introduction of the “Shenzhen River Flood Control Planning Report”. In 1997, the first phase of the Shenzhen River regulation project was completed and an area of 87 hectares was vacated to become the Lok Ma Chau Loop Technology and Innovation Park, which was later developed in collaboration with Shenzhen-Hong Kong. The project was jointly funded by the Shenzhen and Hong Kong governments and was carried out in four phases, with the Shenzhen-Hong Kong Joint Working Group on Shenzhen River Regulation established to negotiate and make decisions on behalf of the two governments. The project is the first in China to implement a project legal person system, a tendering system, a construction supervision system and a contract management system, forming a distinctive management model. As a result of the treatment, the ecological environment and environmental outlook of the Shenzhen River have been greatly improved (Chen Hongyan, 2010). Similarly, the cooperation between Shenzhen and Hong Kong gradually increased at a later stage, in the Shenzhen Bay treatment, as well as the Dapeng Bay treatment project, which was jointly funded by the governments of Shenzhen and Hong Kong. In addition, there is also the Guangdong-Hong Kong-Macao-Pearl River Estuary Wetland Ecological Protection Project launched in 2004, which plans to spend five years planting 50,000 hectares of mangroves and rescuing 500,000 hectares of precious wetlands around the Pearl River Estuary, thus constructing a mangrove wetland protection circle in the Pearl River Estuary (Gan Xueming, 2004).

2) Regional linear green corridors

On the basis of the “Action Plan” to build a “Green Network”, the Guangdong Provincial Government prepared the “Master Plan for the Pearl River Delta Greenway Network” in 2017 to extend the regional greenway network to the entire Greater Bay Area, defining a general layout of “6 main routes, 4 connecting routes, 22 branch routes, 18 inter-city interfaces and 4,410 square kilometers of green buffer zones”, interfaces with Hong Kong and Macao and the north-eastern part of Guangdong have been reserved, and through the introduction of the “Guangdong Provincial Financial Special Funds Management Measures”, the provincial financial budget has been arranged for the co-ordination and guidance of the planning and construction of the greenway network in the province and for subsidies for the preparation of greenway planning in less developed areas. In 2020, based on the construction of greenways, Guangdong Province will prepare the “Master Plan for Guangdong’s WANLI BIDAO (2020-2035)” in conjunction with the “Blue Network” system to build 10,000 Mile BIDAO and further expand the

area covered by regional ecological corridors. Unlike greenways, the construction requirements of the BIDAQ focus on the water system, emphasizing the extension or construction of new greenway systems along the banks of water bodies while meeting flood control requirements, and are divided into natural ecological BIDAQ, rural BIDAQ, urban BIDAQ according to urban and rural types. In addition, the river chief system has been introduced, a river chief office has been set up within the administration (usually headed by the highest leader of the governance hierarchy), and the use of supportive funding for greenway construction has been changed to incentive-based special funding.

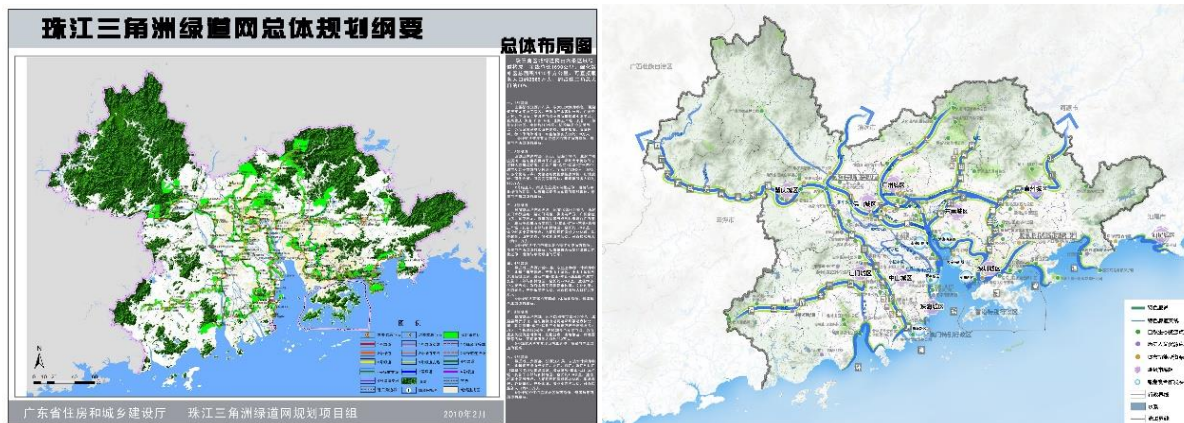


Figure 5. Pearl River Delta Greenway Network Master Plan (left) & Guangdong Wan Li Bi Road Master Plan (right) . Source: "Outline of the Master Plan for the Pearl River Delta Greenway Network" & "Guangdong WANLI BIDAQ Master Plan"

4. Discussion

Through improving the multi-level governance framework, jointly preparing regional blue-green cross-border spatial plans, signing diversified cross-border environmental governance agreements, and jointly carrying out blue-green spatial cooperation projects in various forms have jointly formed the cross-border practice of blue-green space in the Guangdong-Hong Kong-Macao Greater Bay Area for more than 40 years, and have achieved rich results. However, at the same time, the following practical dilemmas will still exist.

4.1. The management of blue-green space has still not broken through administrative boundaries

Although cities and regions have made regional cross-border plans and in practice in specific projects the routes of greenways and bikeways are also connected across borders. However, the blue-green space in a broad sense needs to be managed in a unified manner on a larger scale in order to avoid contradictions between cities in terms of development and protection of upstream and downstream.

4.2. The lack of decision-making mechanisms has led to a lack of synergy

Hong Kong and Macau are based on the theory of free development and are characterized by "small government, big society", while mainland are characterized by "big government". Although there is a joint conference as a safeguard, the institutional framework of the joint conference is still consultation-based. When faced with major decisions, Guangdong, Hong Kong and Macao still rely on the coordination of the central government, making it difficult for them to make joint decisions from their own voices. Hong Kong is more concerned with the legitimacy of the process than the Mainland and Macau are with the enforceability of the outcome. As a result, the short duration of the public participation process and

the low level of openness have led to opposition within Hong Kong to "Being planned" when major decisions are made jointly by the three places.

4.3. Fragmented management of administrative agencies makes it difficult to facilitate the implementation of integrated decision-making

The departments involved in the management of blue-green space include natural resources, agriculture, forestry, water conservancy, marine, finance and other departments, which makes it easy to have fragmented and multi-headed management and difficult to co-ordinate the work. The lack of clarity in the attribution and powers and responsibilities between different departments and regions often leads to conflicts of powers and responsibilities in the planning and management of the same object.

5. Conclusion

Blue-green space has functions such as cooling, noise reduction and reducing evaporation from water bodies, which can improve the urban heat island effect and enhance urban climate resilience. At the same time, blue-green space can also alleviate problems such as urban flooding and water shortage, improve the stability of urban or regional water circulation systems, and enhance the climate adaptation of cities and regions. Blue-green transboundary space is an important means to effectively promote regional climate regulation and is an important element of transboundary governance. This study introduces China's experience and best practices by introducing the practice of flexible planning and governance of blue-green spaces in the Guangdong-Hong Kong-Macao Greater Bay Area construction region. In the future, the cross-border planning of blue-green space in the Guangdong-Hong Kong-Macao Greater Bay Area needs to further set up planning units on an ecological or watershed scale, as to facilitate the implementation of regional planning. In terms of governance, there is a need to build a regional tri-government structure with decision-making capacity to facilitate the implementation of policies and plans in the cross-border region. In addition, there is a need for openness in the process, encouraging informal cooperation and the participation of multiple social actors, and for greater public awareness, education and participation in planning decisions on blue-green space as a resource shared by citizens.

6. References

- Change, I. C. (2014). Mitigation of climate change. Contribution of working group III to the fifth assessment report of the intergovernmental panel on climate change, 1454, 147.
- Chen Guanghan, Xie Baojian.(2012). A Study on the Dynamics of Institutional Change in Guangdong-Hong Kong-Macao Cooperation. Macao Polytechnic Journal: Humanities and Social Sciences Edition,(2):45-51.
- Dąbrowski, Marcin. (2018). "Boundary spanning for governance of climate change adaptation in cities: Insights from a Dutch urban region." *Environment and planning C: Politics and Space* 36.5: 837-855.
- Dong Ha. (2014). Legal Aspects of Cooperative Governance for the Specificity and Coordinated Development of the Guangdong-Hong Kong-Macao Greater Bay Area. *Society under the Rule of Law* , No.40(04):1-15.DOI:10.19350/j.cnki.fzsh.2022.04.001.
- Francesch-Huidobro, Maria, et al. (2017). "Governance challenges of flood-prone delta cities: Integrating flood risk management and climate change in spatial planning. " *Progress in planning* 114: 1-27.

- Gu Chunting. (2017).Meeting of the Zhuhai-Macau Environmental Protection Cooperation Working Group held to continue deepening regional environmental cooperation . Zhuhai Special Administrative Region Daily, 2017-04-24.
- Gan Xueming. (2004).Guangdong, Hong Kong and Macao jointly call for the protection of wetlands in the Pearl River Delta and invest 500 million to plant 50,000 hectares of mangroves [N]. Nanfang Daily, 2004-02-03.
- Geneletti, Davide, and Linda Zardo. (2016)."Ecosystem-based adaptation in cities: An analysis of European urban climate adaptation plans." *Land use policy* 50: 38-47.
- Makkonen, Teemu, and Stephan Rohde. (2019)."Cross-border regional innovation systems: conceptual backgrounds, empirical evidence and policy implications." *European Planning Studies* 24.9: 1623-1642.
- Ma Xiangming, Chen Yang, Li Zhifeng. (2019).History, characteristics and outlook of urban planning in the Guangdong-Hong Kong-Macao Greater Bay Area[J]. *Journal of Urban Planning*, No.253(06):15-24.DOI:10.16361/j.upf.201906002.
- Wu, M., Wu, J., & Zang, C. (2021). A comprehensive evaluation of the eco-carrying capacity and green economy in the Guangdong-Hong Kong-Macao Greater Bay Area, China. *Journal of Cleaner Production*, 281, 124945.
- White, Iain, and Juliet Richards. (2007)."Planning policy and flood risk: The translation of national guidance into local policy." *Planning, practice & research* 22.4: 513-534.
- Wu Lei, Zheng Junyu. (2016).Study on the innovation mechanism of regional air environment management in Guangdong and Hong Kong . *Resource Development and Market*, 32(10):1172-1177.
- Wang Shifu, Lian Dongxin, et al. (2023). Spatial Planning Strategies and Collaborative Governance for Guangdong-Hong Kong-Macao Greater Bay Area Cross-border Cooperation Zone: The Case of Nansha New District in Guangzhou. *Planner*, (3): 101-108 .
- Perkmann, M. (2003). Cross-border regions in Europe: Significance and drivers of regional cross-border co-operation. *European Urban and regional studies*, 10(2), 153-171.
- Yang, Z., et al. (2019)."Spatial pattern of urban heat island and multivariate modeling of impact factors in the Guangdong-Hong Kong-Macao Greater Bay area." *Resources Science* 41.6 (2019): 1154-1166.
- Yu, Zhaowu, et al. (2020)."Critical review on the cooling effect of urban blue-green space: A threshold-size perspective." *Urban Forestry & Urban Greening* 49: 126630.