



Current Situation and Management Effect of Water Resources in Guangdong-Hong Kong-acao Great Bay Area

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1、 The Guangdong–Hong Kong–Macao Greater Bay Area

The Guangdong–Hong Kong–Macao Greater Bay Area includes nine cities in the Pearl River Delta and two special zones in Hong Kong and Macao, forming a "9+2" urban development pattern .

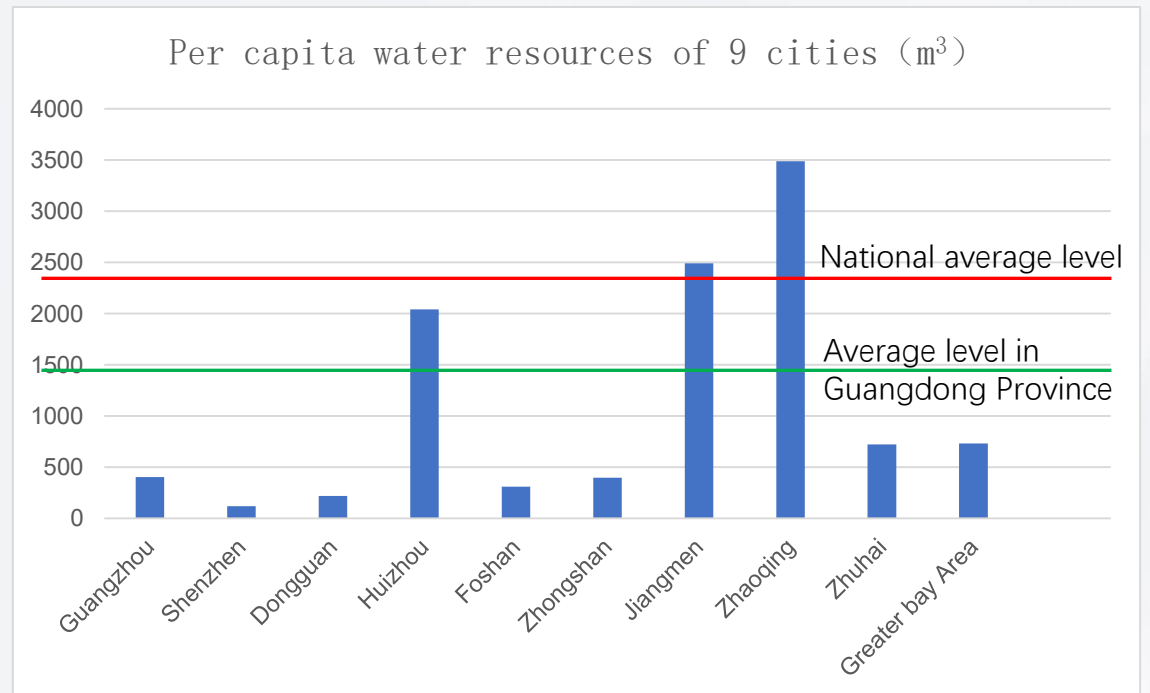
The Guangdong–Hong Kong–Macao Greater Bay Area is one of the regions with the highest degree of openness and the strongest economic vitality in China. As an important and irreplaceable strategic resource, the safety and management level of water resources plays an important supporting role in the high-quality development of the Greater Bay Area.



1、 Water resources and its distribution characteristics

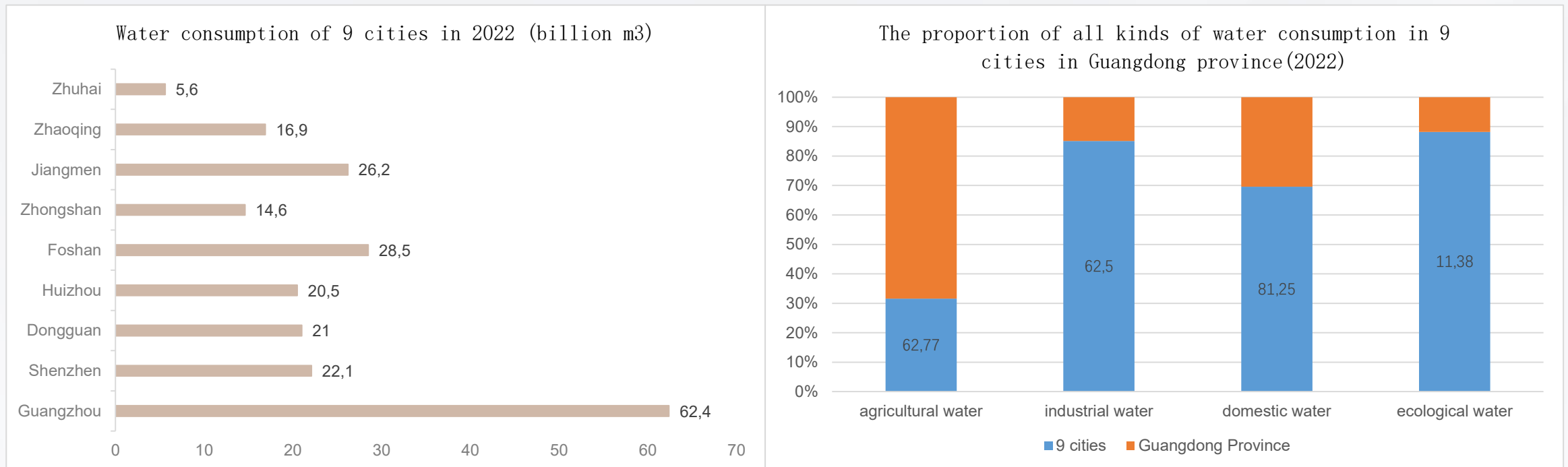
The Greater bay Area is located in the lower reaches of the the Pearl River Basin, and its water resources are mainly passenger water. The amount of inbound water is about 280 billion m³, and the amount of local water resources is 58.3 billion m³. The per capita amount of local water resources is only 747 m³, less than 1/2 of the national average. Some cities are seriously water deficient.

City	Per capita water resources (m ³)
Guangzhou	404
Shenzhen	121
Dongguan	221
Huizhou	2042
Foshan	310
Zhongshan	399
Jiangmen	2491
Zhaoqing	3488
Zhuhai	722
Greater bay Area	731



2、 Water resource usage in the Bay Area

According to the data in the Guangdong Water Resources Bulletin (2022), 9 cities in Guangdong–Hong Kong–Macao Greater Bay Area are densely populated, with a large economic aggregate. The total water consumption is 21.78 billion m³, accounting for 54.2% of the total water consumption in the province. Among them, industrial water and ecological water account for more than 80%, and Farm water accounts for the lowest proportion.



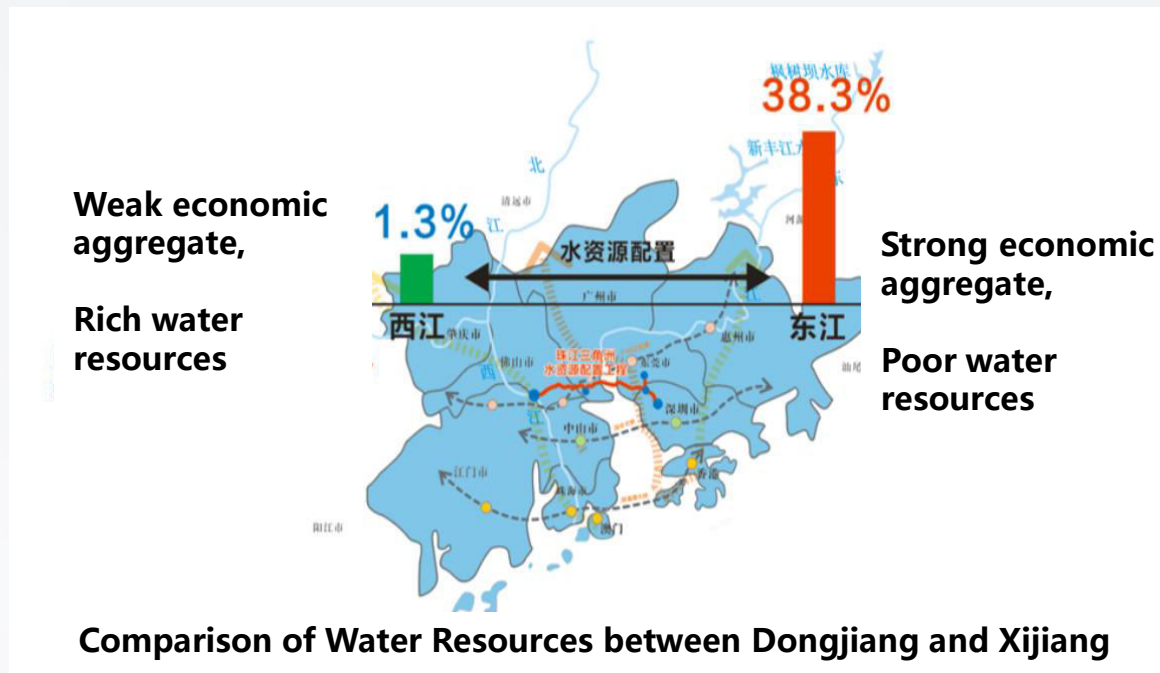
3、 Current Situation of Water Resource Allocation in the Bay Area

Dongjiang, Xijiang, and Beijiang are the three main sources of raw water supply in the Bay Area. Dongjiang mainly supplies Hong Kong, cities in the eastern part of the Bay Area, and parts of Guangzhou. Xijiang mainly supplies six cities in the western part of the Bay Area, while Beijiang mainly supplies cities in the northern part of the Bay Area and parts of Guangzhou. Hong Kong and Macau mainly rely on water supply projects connected to the mainland to meet their water supply needs.



4、 Water resource situation

With the acceleration of urbanization, the increase in water demand in various regions is bound to have an impact on the original water supply structure, highlighting the contradiction in water use. In addition, the rapid development of population and economy in the Bay Area has brought about the continuous deterioration of water environment and the impact of the upstream salt tide in the the Pearl River Estuary. The future water resources in the Bay Area are facing severe challenges.



The challenges faced by water safety assurance

Low water resource utilization efficiency and conservation level

There is still a certain gap between the water efficiency of the bay area and the advanced level of the international first-class bay area. Some regions face the problem of insufficient water use indicators in the long term, and it is urgent to improve the efficiency and conservation level of water resource utilization.

Insufficient level of water supply safety guarantee

The urban water supply system of the Guangdong–Hong Kong–Macao Greater Bay Area mainly relies on river water intake, which accounts for about 80% of the total water supply. There is a risk of a single water supply source. During the dry season, the water supply safety in Macau, Zhuhai, Zhongshan, Guangzhou, Dongguan and other places is severely affected by salt tides.

the water ecologic environment is relatively fragile

68% of river discharge outlets and 72% of wastewater discharge in Guangdong Province are concentrated in the nine cities of the Pearl River Delta. Some rivers have severe water pollution, and the natural carrying capacity of rivers is approaching its limit, making it difficult to achieve significant improvement within a certain period of time.

1、 Strengthen the strictest water resource management system, The efficiency of water use has been gradually improved

01

Implement water allocation

Clarify the indicators for total water use control, strictly implement total water use control, and consider the development model of the Bay Area urban agglomeration under the premise of total water use control.

02

Adhere to prioritizing water conservation

Establish and improve the water use standard quota system for the Greater Bay Area, strictly carry out water-saving evaluation, supervision, and publicity education.

Comprehensively improve the water use efficiency of the Greater Bay Area.

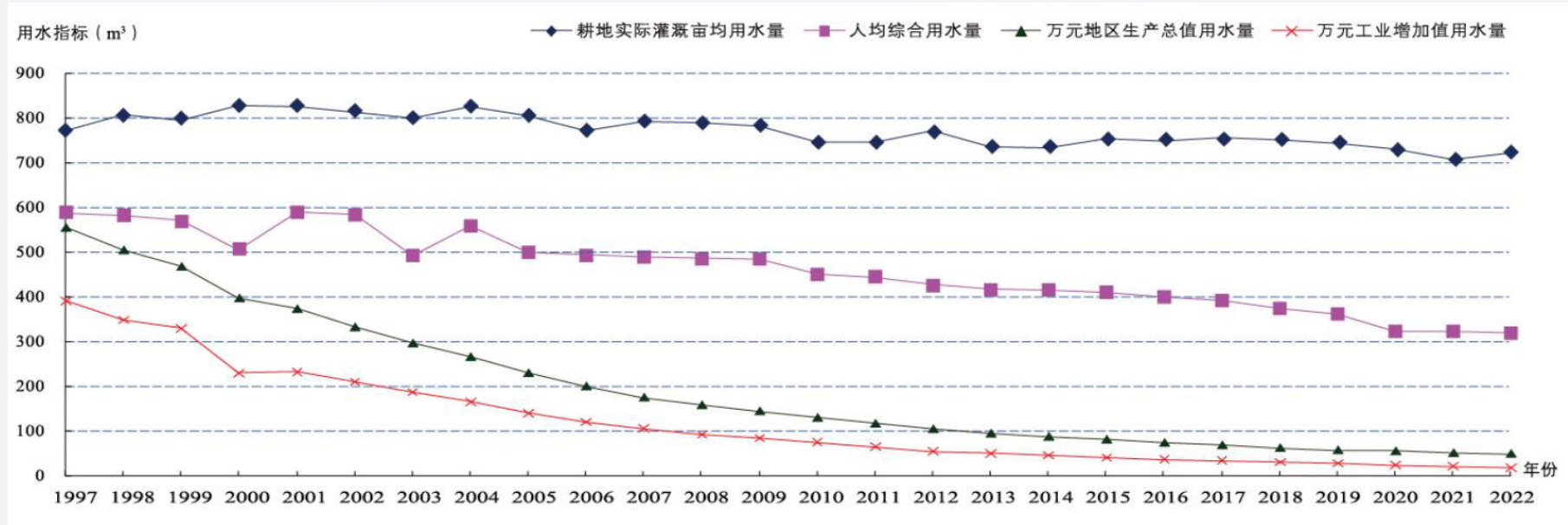
03

Promote unconventional water resource utilization

Integrate unconventional water resources into regional water resources for unified allocation, and promote the utilization of recycled water, rainwater resource utilization, and seawater desalination based on the actual conditions of the Greater Bay Area cities.

Since 1997, the water use efficiency of Guangdong Province has significantly improved.

The water consumption per 10000 yuan of Gross regional product and per 10000 yuan of industrial added value have both declined significantly, and the per capita comprehensive water consumption and the actual per mu irrigation water consumption of cultivated land have also declined slightly.



Area	Year	comprehensive water consumption per capita	water consumption per 10000 yuan of Gross regional product	water consumption per 10000 yuan of industrial added value	Actual irrigation water consumption per mu of cultivated land	per capita domestic water consumption	Domestic water consumption of urban and rural residents
The Greater Bay Area	2019	345	25.3	23.2	725	195	140
	2020	276	23.9	20.6	692	277	163
	2021	282	22	17.6	690	287	180
	2022	278	20.8	15.7	687	283	179

2、Implement unified water resource scheduling, accelerate the construction of water resource allocation projects, Water shortage in the bay area has been alleviated

Engineering layout:

Water is diverted from the Xijiang River and stored through the main line from west to east, passing through Foshan, Zhongshan, Guangzhou Nansha, Dongguan, and Shenzhen in sequence. The reservoirs, underground rivers, and river channels along the way are connected using a "long vine and melon" method, achieving the connection between the east and west rivers.

Pearl River delta water resources allocation project

工程从位于佛山市顺德区的西江鲤鱼洲取水，输水线路经鲤鱼洲（取水点）、高新沙、罗田三级泵站加压，输水至广州市南沙区规划高新沙水库（新建）、东莞松木山水库、深圳罗田水库和公明水库。

设计流量80立方米/秒

设计规模17.87亿立方米/年

输水线路总长113.1千米

工程总投资约338亿元人民币



3、Implement the ' Water Ten ' action plan, The water ecological environment has been continuously improved

According to the data of ' 2022 Guangdong Provincial Ecological Environment Bulletin ', the overall water quality of 79 sections in the Pearl River Delta river network area is excellent. The proportion of sections with water quality categories of I-III accounted for 91.1 %. The proportion of sections with water quality categories of IV accounted for 8.9 %. There were no sections with water quality categories of V and inferior V.

