

Water-System Foundations of Chang'an's "Heavenly Provision for All Nations" during the Sui and Tang Dynasties: The "Eight Waters Surrounding Chang'an"

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Abstract: The Wei River is on the north side and the Qinling Mountains are in the south of the Guanzhong Plain. The Jing, Wei, Ba, Chan, Feng, Lao, Hao, and Yu Rivers were collectively called the "Eight Waters" and made up the basic water system of Chang'an. During the Sui and Tang dynasties, five canals were built using the natural rivers to extend the functions of the Eight Waters system for urban water supply, irrigation, grain transport and flood control, and also to shape the location and space of the capital. Therefore, the Eight Waters were no longer natural rivers but hydraulic systems that supported the operation of Chang'an; gradually, they were integrated into Tang poetry and the city's landscape and became rich symbols of culture and history. The eight waters and Chang'an are closely linked in the system of water management, transportation, urban life and literature, and natural water environments have played an important role in the construction and operation of the imperial city.

1. Introduction

Sui-Tang Chang'an is a typical model of an ancient Chinese capital and has attracted much research interest. He Zhizhang's well-known phrase, "Radiant is the Tang; Heaven has bestowed it upon the myriad states", describes the glory of the city in the Tang Dynasty. Most of the previous studies have focused on capital planning, political institutions and urban space; however, the impact of these on the formation and maintenance of Chang'an's urban environment by the natural water system has not been studied.

The "Eight Waters Surrounding Chang'an" is a historical system of waterworks in the Guanzhong Area that can be traced back to Sima Xiangru's Shanglin Fu, and it comprises the Ba, Chan, Jing, Wei, Feng, Hao, Lao, and Yu Rivers. Centered on the Wei River, the eight rivers in the Guanzhong area made up the main water system. During the Sui and Tang dynasties, artificial hydraulic works were constructed to connect this regional water network with Chang'an, and natural rivers and canals were integrated into the urban water environment of the capital. Since the Han Dynasty, Chang'an's position as the imperial capital has been closely linked to the good hydrological and geographical conditions of the Guanzhong region. Thus, the Eight Waters were not only the natural

environment around the capital but also a basic geographical foundation for the development of Chang'an and imperial life.

2. The Water System of the Chang'an Region in the Sui and Tang Dynasties

During the Sui and Tang Dynasties, artificial hydraulic works were constructed, such as the Five Canals, to link the regional water system more closely with Chang'an and integrate the natural rivers and canals into the urban water environment of the capital. Since the Han Dynasty, Chang'an has been a place for the imperial court due to its good water resources and favourable geography in the Guanzhong area. Thus, the Eight Waters were not only the natural environment around the capital but also a basic geographical foundation for the development of Chang'an and imperial life.

The Eight Waters around Chang'an had many purposes. The main sources of water for agriculture in the Wei and Jing River areas were the canals named Zhengguo, Liufu and Baigong. East of Chang'an, the Ba and Chan Rivers were used to build the Longshou and Huang Canals for transport and urban water supply, and they connected with Qujiang Pond and Xingqing Palace. To the southwest were the Feng and Hao Rivers, and Fengjing and Haojing were built along them; the Lao and Yu Rivers served the southern suburbs. Therefore, the Eight Waters supported Chang'an's agriculture, transportation and urban water supply.

The Eight Waters around Chang'an had various purposes. The Wei and Jing Rivers supplied water for irrigation in the area, and then canals such as Zhengguo, Liufu, and Baigong Canals were constructed. East of Chang'an, the Ba and Chan Rivers provided transportation and urban water supply through the Longshou and Huang Canals, and were connected to Qujiang Pond and Xingqing Palace. To the southwest were the Feng and Hao Rivers, and Fengjing and Haojing were established along them; the Lao and Yu Rivers supplied the southern suburbs. Therefore, the Eight Waters provided water for agriculture, transportation and urban life in Chang'an.^[1]

3. The Role of the "Eight Waters Surrounding Chang'an"

A rich river network in the Guanzhong area provided water for life and a good place for Chang'an. The Eight Waters provided irrigation and urban water supply, facilitated grain transport, distributed granaries and supported the military, and thus promoted the urbanisation and capital status of Chang'an. Therefore, "The Eight Waters Surrounding Chang'an" refers not only to the location of the eight rivers but also to their integration with the city through diversion and irrigation works. By the Sui and Tang Dynasties, they had also built artificial canals to improve the water supply system in Chang'an.^[2]

3.1 Water Supply

As the capital of the Sui and Tang dynasties, Chang'an was a large city with a considerable water-supply demand. The city had many lakes and ponds, and according to the Chang'an Zhitu^[3], there were about thirty or forty garden ponds that were all supplied by the Eight Waters and their canal system. The Eight Waters also provided water for the people's daily lives. Wells and springs were especially common; one example is the "Eight-Cornered Well" mentioned in the Taiping Guangji^[4], and its water was connected to the Wei River. The Eight Waters were used for agricultural irrigation. Song Minqiu's Chang'an Zhi records that their water could be used by the people for irrigation. Thus, the Eight Waters and their canals served the needs of the city and farmers.

Drainage was another concern. Sui-Tang Chang'an is south of Shaolingyuan and across from Longshou Mountain; in summer, it frequently rains, and the city is low-lying. Tang records report

serious floods in the eighth year of Kaiyuan and the second year of Zhenyuan, which damaged farmland, roads and houses. Even a light rain would cause mud and become impassable; in 764, when the officials went to court in the second year of Guangde, the court repeatedly dredged canals and constructed sand embankments to improve drainage, but the problem of floods was still not solved.^[5] Therefore, the Eight Waters offered both water and a natural environment for the problems of urban governance, and Chang'an's water management has been in continuous conflict with the principle of "water extraction" and "water control".

Tang also used the Eight Waters to show social relations of water distribution. The Taiping Guangji recorded the story of the "Haozhou Well": in a drought year, a tavern hired labourers to dig a well for drinking water; however, both the father and son died shortly after, and the well was never used again. The Nanbu Xinshu (Part D) also states: "Chang'an County contributed earth, and Wannian County contributed water." Thus, water was included in the local tribute system and became one of the burdens on the people.^[6] The Eight Waters have long supported agriculture in Guanzhong. In the Shiji^[7], Hequ Shu reports that the Zhengguo Canal "irrigated more than 40,000 qing of saline and alkaline land" and "made the Guanzhong Plain fertile". Later, with the construction of the Baigong and Sanbai Canals and the Tang Canal, such as the Huang Canal, the Jing Basin was further developed and irrigated. The Xuanzong Ji records crop damage caused by heavy rain and snow in the twenty-ninth year of Kaiyuan and shows that rice cultivation was important in Guanzhong. Waterpower was used to operate mills, and according to the Chang'an Zhitu, these mills worked "day and night without stopping" to provide food for "a thousand people". Gao Lishi alone built five water-powered mills by diverting the Feng River, and many Buddhist monasteries in the capital also had such mills. Therefore, the Eight Waters and their canal systems had become closely linked with agricultural production and urban economic life.

Besides farming, the Eight Waters and their lakes were rich in aquatic life. Kunming Pond was a large lake in Sui-Tang Chang'an and a good fishing ground. Bai Juyi's "Spring Waters of Kunming Pond" shows people fishing and picking reeds in his area. Xingqing Pond, Qujiang, Yizao Pond and Huangzibei grew aquatic plants; fishing took place in the Wei, Feng and Lao Rivers. The Eight Waters and their canals also supported agriculture in Guanzhong, and as the Shijing, "Baihua", says, "Biao Pond flows north and irrigates the rice fields"; thus, irrigation by water diversion had a long history. Under the Sui and Tang dynasties, the Huang Canal was built to continue distributing the water-transport benefits of the Eight Waters to the agricultural area of Guanzhong.

3.2 Promote Transportation

By the Sui, Chang'an had a developed grain transport and storage system. In the third year of Kaihuang, with the "capital's granaries still empty", the court "recruited men to transport rice" in the thirteen waterway prefectures and built granaries at Liyang, Heyang, Changping and Guangtong; these were "connected in succession" to supply grain to the capital from Guandong and Fen-Jin, and by the Tang Dynasty, the five canals had improved urban transport. Emperor Xuanzong had Han Chaozong build a canal in the Yu River to carry firewood and charcoal from the Zhongnan Mountains to Jin'guang Gate and the Western Market. Thus, the Eight Waters and their canals served to supply water and carry grain and other goods.

The five canals provided water supply and local topography for the extension of the Eight Waters to Chang'an. The Longshou Canal took water from the east of the capital; the Qingming, Cao and Huang Canals joined the Yu River, and the Yong'an Canal used the Sheng River and followed the southwest-high and northeast-low terrain. According to the Shui Jing Zhu, Chengguo Canal flowed into the Wei River and was built by Wei Weizhen during the campaign against Shu; later, it was used for irrigation in the Han Dynasty. The Eight Waters extended their hydraulic functions beyond

Chang'an through a canal system, and waterways such as the Wei carried grain from the countryside to the city and provided for the grain supply of the capital.

During the Sui and Tang Dynasties, the Eight Waters and five canals were used to transport and store grain. Large granaries lined the Sui waterways; by Emperor Yang's reign, Luoyang's Taicang, Xingluo, and Huiluo granaries had been built. Tongdian records that the main Sui granaries held up to 10 million shi of grain, and the smaller ones were several million.^[8] The Wei River was also a good waterway. The Shijing and Huainanzi mention that it was used for crossing and grain transport, and emphasize that the Wei and Eight Waters' canal system supported agriculture, grain transport and storage in the Guanzhong region.^[9]

3.3 Defence

The Eight Waters diverted the floodwater and formed the foundation of urban drainage in Chang'an. When the Qinling was in flood, it was directed to the Wei River to reduce the damage to the city and ease the drainage pressure. The five canals and their tributaries also carried away the runoff from the city and discharged the rainwater outside the city. Therefore, the Eight Waters were not only for drinking in Chang'an but also constituted an important part of its flood control and drainage system.

Grain transportation and military purposes were addressed by Emperor Wen of the Sui Dynasty. In the fourth year of Kaihuang, due to heavy sedimentation and unstable depths of the Wei River, he ordered Yuwen Kai to take the hydraulic workers and build a canal to divert the river from east of Daxing City to Tongguan, more than 300 li away. During the Sui and Tang dynasties, the northwest was a key military region, and grain transport was mainly for the Guanzhong and northwest areas. As shown in the Xin Tang Shu^[10], Guanzhong had limited land and a low grain output, so regular water transport of grain from the southeast was needed to supply the capital; as a result, water transport from the Yellow River to the Wei River area was revived. As the capital area was closer to the northwestern military frontier, good and economical transport had to be provided; therefore, the Eight Waters near Chang'an were suitable for short-distance transport and were added to the grain-transport system.^[11]

4. The Cultural Significance of the Eight Waters in Sui-Tang Chang'an

The Eight Waters not only formed Chang'an's natural water system but also became important literary imagery. From the *Shijing* and pre-Qin prose to Han fu and Tang poetry, they frequently appeared in texts, particularly during the Sui and Tang dynasties, with poets such as Li Xian, Xu Jingshen, Luo Binwang, and Bai Juyi depicting Chang'an's waterscapes and water-related activities.^[12] The Ba River, for example, became closely associated with farewells at Ba Bridge and the custom of breaking willow branches. The Eight Waters thus transcended their geographical significance to become carriers of urban life, travel, and literary memory, acquiring diverse meanings in Tang poetry.

The "Eight Waters" became a prominent cultural image of Chang'an in Tang poetry. Shao Yan and Xu Jingshen evoked the city's spring scenery through images of the Eight Waters, while Bai Juyi referred to their diversion to replenish Kunming Pond, linking them to urban water management and daily life. Wei Yingwu's "Li Shan Xing" further invoked the Eight Waters in reflecting on Chang'an's historical rise and decline.

At the same time, individual rivers acquired distinct cultural associations. The Ba and Chan Rivers became associated with parting through farewells at Ba Bridge and along the Chan River. Li Bai wrote, "Year after year, the willow colors bring sorrow at Baling for parting," while Wen Tingyun's "Seeing Off a Friend at the Chan River in Early Spring" describes seeing off travelers

beyond Qingmen. The Jing and Wei Rivers, by contrast, became associated with the contrast expressed by “Jing and Wei clearly distinct.” Wei Ting’s “Praise of the Jing River” writes of “the turbid current” joining “the Wei’s clear waters,” juxtaposing clarity and turbidity. References to the Eight Waters ran throughout the Tang, from natural scenes to urban practices such as willow-breaking at Ba Bridge and drinking at Qujiang. They thus became both Chang’an’s landscape and a recurring literary image.

The Eight Waters strongly shaped Chang’an’s cultural landscape. Qujiang and Kunming Ponds were linked to the Eight Waters and their canals. Kunming Pond, created by Emperor Wu of Han by diverting the Feng River for naval training, became a renowned leisure site by the Sui and Tang.^[13] The *Chang’an Zhi* called it “a splendid landscape of rippling water and reflected trees.” Later landscapes such as Ba willows and Qujiang drinking likewise reflected Chang’an’s water system. Rivers, canals, ponds, and marshes thus shaped the urban landscape and acquired literary and social meanings.

More importantly, in Tang writings, the Eight Waters were no longer merely a geographical concept but acquired distinct urban cultural significance. They evoked both the spring prosperity and grandeur of Chang’an and emotions of farewell and nostalgia. Wei Yingwu’s lines, “The Eight Waters of Qin-chuan wind endlessly around, while the Five Han tombs rise high in vain,” linked them to Chang’an’s history. Through sustained urban life and literary writing, “the Eight Waters encircling Chang’an” thus evolved from a geographical landscape into a cultural symbol of the city.

5. Conclusion

Guanzi, “Shui Di,”^[14] states: “What is water? It is the origin of all things and the ancestral abode of all living beings.” Water was not only fundamental to the rise, transformation, and prosperity of imperial capitals, but also their soul and lifeline, making it a cornerstone of urban vitality.

During the Sui and Tang periods, the Eight Rivers contributed significantly to Chang’an’s development, owing not only to the relatively warm climate but also to human intervention. State-led water management, land reclamation, and projects such as the Five Canals integrated the natural rivers into a hydraulic network centered on Chang’an. The interaction of favorable environmental conditions and human efforts provided an important foundation for the city’s prosperity, reflected in the phrase, “Illustrious was the Tang, and Heaven enabled it to serve all under Heaven.”

Historical changes in river courses and the environment continually reshaped the Eight Waters. Thus, “the Eight Waters surrounding Chang’an” was not merely a historical landscape, but also a lens for examining urban development and human–environment relations. Their roles in water supply, transportation, flood control, and urban life reveal how state intervention and social use reshaped the natural water system and integrated it into Chang’an’s urban history.

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