

REVIVAL OF SHAN-SHUI IDEA AS A SUSTAINABLE URBAN FORM – A CASE STUDY ON HANGZHOU

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ABSTRACT: A Chinese word Shan-shui (山水) was widely used in the planning and development of many Chinese cities recently, to epitomize the ideas of sustainable development in environmental, social, and economic terms. This paper, with a case study on Hangzhou, seeks to address the issues of why the word Shan-shui can be introduced to urban design, and how it is used to create a sustainable urban form. Hangzhou city, which was once called “the finest and most splendid city in the world” by Marco Polo, is a city formed and well-known by its unique “mountain-lake” environment. The city is closely related to the traditional ideal of “Shan-shui” in China, and it gives us an approach to explain the forming of Shan-shui idea as a sustainable urban form in a visible and tangible way.

KEYWORDS: Shan-shui, Sustainable urban form, Hangzhou

1 INTRODUCTION

In recent years, the planning and development of many Chinese cities has been linked to global concept of ecology, which aims to sustainable development in environmental, social, and economic terms. But other than use the word ecology itself, a Chinese word Shan-shui is widely used to identify the concept of ecology. In Chinese, the word Shan-shui (山水), which literally means mountain-water, is used to refer to a style of Chinese painting that involves or depicts scenery or natural landscapes, or refers to a movement in poetry, and is sometimes extended to include gardening and landscape design. Thus the word Shan-shui has a subtle nuance of artistic nature involving a complicated and rigorous set of almost mystical requirements for balance, composition, and form.

The phrase ‘Shan-shui city’ was first used by Dr. H.S.¹ in 1990 to name an ideal for a future Chinese city, which tried to introduce the traditional idea of Shan-shui in poetry, painting, and gardening into urban planning, and to make the city ‘a big garden’. This idea led to an extensive discussion and became influential in the field of urban planning in China. Due to the complex and nonfigurative meanings of Shan-shui, and the essential differences in real practice between the two fields of gardening and urban planning however, this ‘Shan-shui city’ idea has not yet been realized. It is much like a vague inspiring slogan rather than a feasible clarified planning idea.

This paper seeks to address the issue of how a Chinese form of Eco-city can be formed as Hangzhou through its geographic and morphologic evolutions. This requires making a series of form analyses, based on the existing maps. After outlining the particular approach to Shan-shui city which Hangzhou represents, I then argue for a relationship between the traditional Shan-shui and Shan-shui city, and show how Shan-shui city relates to the traditional Chinese gardening, painting, and poetry.

2 FORM & EVOLUTION OF HANGZHOU

2.1 Topography

¹ Tsien Hsue-shen (simplified Chinese: 钱学森; born December 11, 1911) is a scientist who was a major figure in the missile and space programs of both the United States and the People's Republic of China. NASA documents commonly refer to him as H.S. Tsien.

According to the Qiantangji², the city of Hangzhou was founded about 2200 years ago during the Qin Dynasty (221BC-206BC). At that time, Hangzhou, called Qiantang, was located in the mountains at the west side of the lake, because the lake and the plain area at the east side still suffered from flooding because of the tide of the Qiantang River. Since the development was limited by the landform in mountains, people started to move into the east plain where the city was finally located, and where the city wall was constructed during Sui Dynasty (581-618CE). The location of the city made a seawall necessary to protect the city from the tides associated with the Qiantang River, which made West Lake no longer a lagoon but a real fresh water lake to be the city's water supply. Since then the basic geographical 'Mountain-Lake-City Form' structure of Hangzhou was shaped.

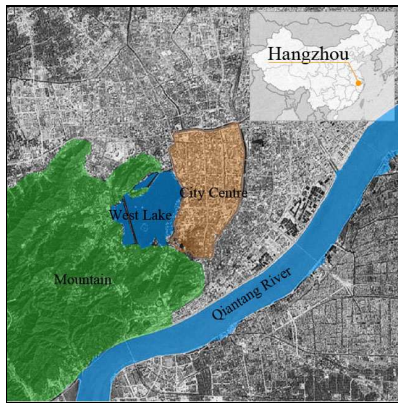
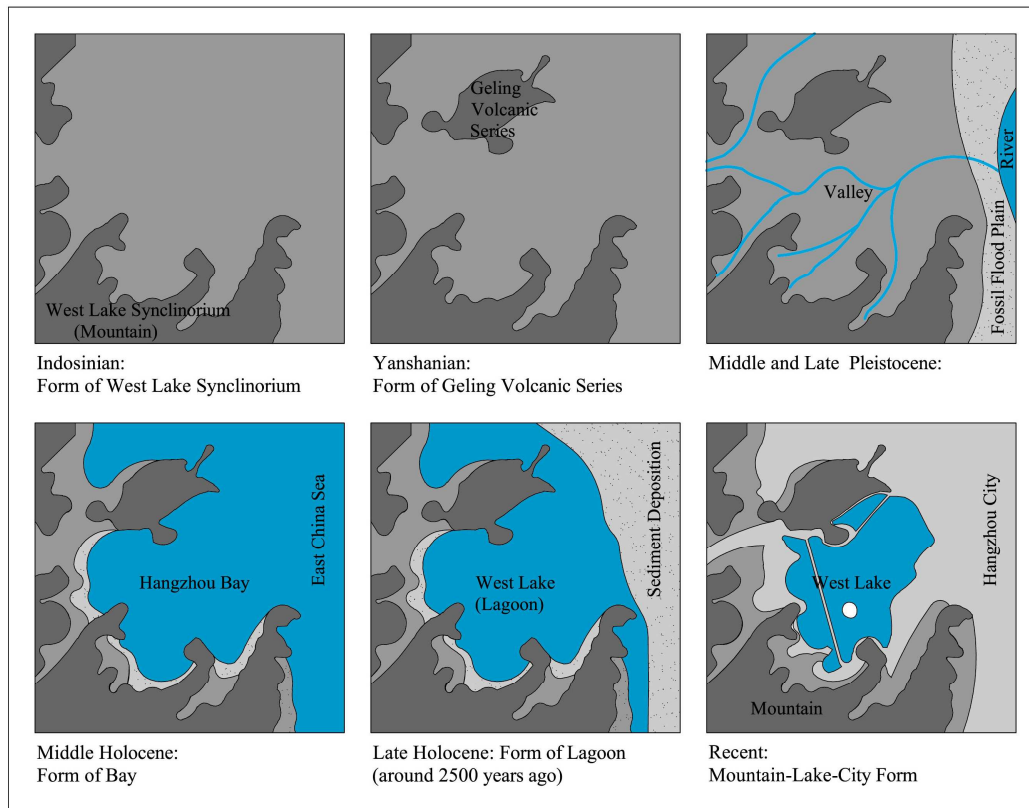


Figure 1 Hangzhou is located in northern Zhejiang province, eastern China. The prefecture-level region of Hangzhou extends west to the border with the hilly-country Anhui Province, and east to the flat-land near Hangzhou Bay. The city center is built around the eastern and northern sides of the West Lake, just north of the Qiantang River. Source: Google map and Author



² Qiantangji (Chinese: 钱塘记), a chorography book about the Qiantang (used to name Hangzhou city), was written by Liu Zhendao (Chinese: 刘真道) who was the governor during the Liusong Denasty (420-279).

Figure 2 Geomorphic evolution at Hangzhou (according to the hypothesis which made by Coching Chu³ in 1920) Source: Master Plan of West Lake (2002-2020) , redrawn by Author

2.2 Man-made determinants

2.2.1 Lake

The basic geographical ‘Mountain-Lake-City Form’ was first shaped by nature, but it will not remain so if not maintained. In this ‘Mountain-Lake-City Form’, the lake is the most important issue which needs intervention. As related before, the lake was naturally a lagoon, and with more and more sediment, it will finally disappear. Thus the evolution of the lake, which was far more influenced by man than nature, is a key object for understanding how and why the unique morphological character was formed.

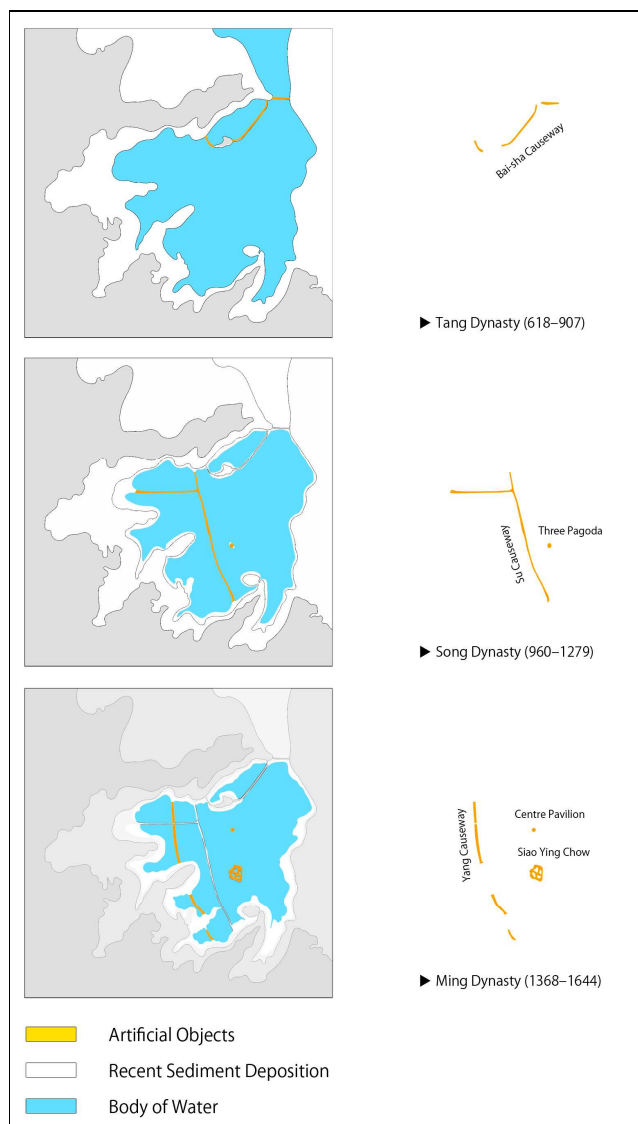


Figure 3 Morphological Development of the Lake. Source: Author drew it based on a graph ‘Transition of Westlake Water Area’ in the Master Plan of West Lake (2002-2020) and confirmed by the history review.

This long-lasting process has been advanced by three important projects. The first one is the foundation of Bai-sha Causeway, a water conservancy project finished during the Tang Dynasty (618-904), which

³ Coching Chu or Zhu Kezhen (simplified Chinese: 竺可桢 7 March 1890–7 February 1974) was a prominent Chinese meteorologist, geologist and educator.

divided the Qiantang Lake⁴ and made one part of the lake a reservoir to provide water for farming. And only this part is saved from sediment, and became the West Lake. The second important project was done during the Song Dynasty (960-1279) by a poet Su Shi (often known as Su Dongpo), while he was the city's governor. He proclaimed the importance of cleaning the lake which was nearly silted up, and to keep it as a water supply for the city. The lake cleaning project was finished while the Su Causeway was built by the silt, and nearby three pagodas were set in the lake to inform forbiddance of planting water caltrop in the lake to protect the lake from silting. The causeway divided the lake into two parts—an inner and an outer—and in order to keep the linkage between, six bridges were built. Since then, the basic structure with inner and outer two parts of the lake has existed. The building of these structures marks a turning point where in the lake is treated using a garden recalling the traditional garden design. And the famous Top Ten Views⁵ of Westlake were shaped later during the Southern Song period.

2.2.2 City Wall

Every city wall foundation, as a defence determinant, can be traced to the very beginning when material and human resources of early settlements first became envied by other societies, creating a need for defence against external attacks⁶. Its construction was also the symbol of the founding of a city in ancient China. It is an important issue for understanding more about a city's founding and its morphological changes.

According to the historical records, Hangzhou city was founded during the Sui Dynasty (581-618 CE), and once became the capital and the most prosperous city of all China during the Southern Song Dynasty (1127-1279). In that time a special area for imperial leaders was necessary, and as the importance of defence, an inner city wall was built around the palace, this kind of double-wall pattern can still be seen in Beijing or Nanjing, which were once empire cities. During the Ming, the urban area expanded and as a result the east side of the city wall was rebuilt, and as Hangzhou was no longer the capital city, the palace area was abandoned and divided out of urban area by the new city wall on the south side.

Since then, this urban form was kept until the wall was removed. During Qing however one area on the west side was divided by inner wall again. This time it is not for the empire's palace, but for an armed community of a privileged class which called the Manchu people who shared the decent with the empire.

The first break of the city wall was in 1907 because of the construction of a train line, the east side of wall was cut to allow the train line go through. This did not destroy the integrity as much as the later break in 1913. The Republic of China was founded in 1912, and since 1913, as the alternation of government, the inner city for Manchu community was abandoned, and the inner wall was removed. And the process of breaking wall was not stopped until the whole west side close to the lake was removed. After existing for at least 600 years, the wall was finally demolished by the wave of modern revolution, but it was also a turning point that the lake was no longer divided from the urban area of the city.

⁴ West Lake was called Qiantang Lake (Chinese: 钱塘湖) during Tang Dynasty, and it is much larger than now.

⁵ The Top Ten includes Spring Dawn at Su Causeway (苏堤春晓), Autumn Moon over the Calm Lake (平湖秋月), Viewing Fish at Flower Pond (花港观鱼), Orioles Singing in the Willows (柳浪闻莺), Three Pools Mirroring the Moon (三潭印月), Twin Peaks Piercing in Cloud (双峰插云), Evening Bell Ringing at Nanping Hill (南屏晚钟), Leifeng Pagoda in Evening Glow (雷峰夕照), Breeze-ruffled Lotus at Quyuan Garden (曲院风荷), and Lingering Snow on the Broken Bridge (断桥残雪).

⁶ A.E.J Morris, History of Urban Form, 1994



Figure 4 Morphological Development of City Wall Source: Author drew it based on data of a remapping work which translates the historical information from the traditional maps and historical literature.⁷

From another analysis figure, the development of a relationship between urban and landscape issues became much clearer, that a more pattern close to nature or an open urban system has been gradually formed since the beginning of the 18th Century.



Figure 5 Development of the Relationship between urban and landscape issues, Source: The same as Figure 4.

2.3 Culture Reflection

From the analysis of the form and development of Hangzhou city, an argument emerges, that Shan-shui Culture affects the process of urban formation. First, the basic form of Hangzhou was done during Southern Song Dynasty, when it was the capital and cultural centre of China, in a period characterized by the pursuit of a highly aesthetic way of life with great developments in art, poetry, and gardening. One more important issue is that the key persons in the process of formation are all of the scholar class of civil servants, which included great poets such as Bai Juyi and Su Shi who are also key people in the understanding of Shan-shui culture. With the primary morphologic analysis, the role of Shan-shui culture in shaping the urban form and how it affects urban landscapes will be discussed by comparing with painting, gardening and poetry that closely related to Shan-shui.

2.3.1 Topographic Similarities with Chinese Garden

Chinese gardens, created in the same way as a combination of landscape and paintings together with

⁷ This remapping work benefits from the prior work which was done by the members in Dong Wei Lab. in Southeast University, China.

poems, is a place for solitary or social contemplation of nature. The first thing made me connect Hangzhou with gardening, is that Kunming Lake in King's Summer Palace in Beijing borrowed the form of Westlake. However, in expending the analysis, more topographic similarities appear.

First is the similarity of landscape components. The three components of Hangzhou city are mountains, a body of water, and a built up urban area. Similarly the garden is always composed of hills or stacked rocks, digging ponds, and houses. Second, three components are proximate. Third, the first two parts related to nature asymmetrically, and the third one--the built environment--is approximately symmetrical or a grid street pattern.

Fourth and the most interesting is that the walled boundary was made between nature and the urban (city wall) or garden with house. But both of the walls are opened in section the gate of city wall and the window of garden wall, to create an ambiguous continuity. In the city, it is functioned as a defence object, but in gardening this ambiguous continuity creates a unique way to enjoy the process before reach the garden. In another way, maybe we can consider that this aesthetic delight is derived from the real experience of city life, an exciting, expectant and poetic mood on the way leaving the noisy urban area, going towards the gate, watching the beautiful scenery through the gate, going through the gate, and finally reaching the world of nature.

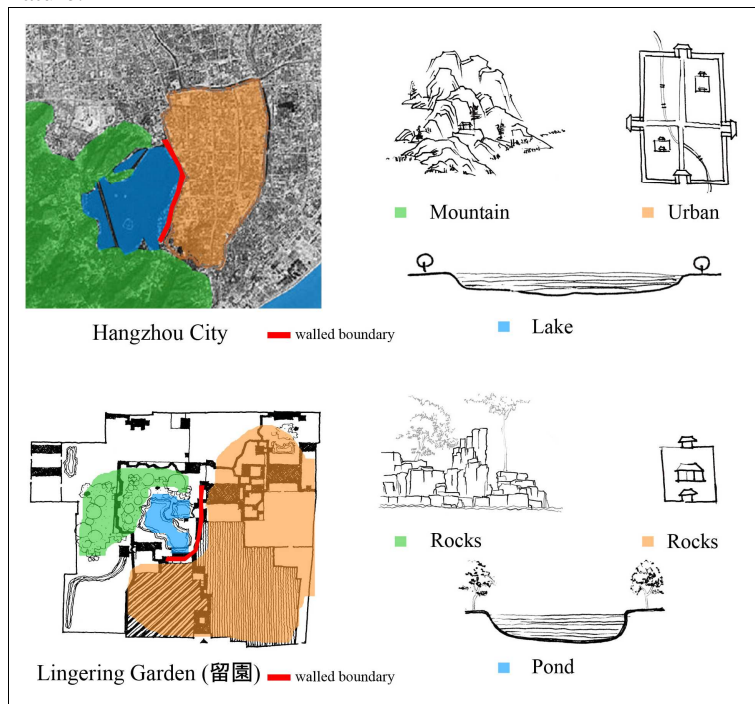


Figure 6 Comparison analysis of Hangzhou city and Lingering Garden Source: Google map and author.

2.3.2 Pursuit of Poetic and Picturesque Views

Another important reflection of or influence from shan-shui culture is the pursuit of poetic and picturesque views. The famous Top Ten Views of Westlake, founded since the Southern Song period, present this tradition. The view was named with poetic words and it was also the origin of artistic creation like paintings and poems. And the tradition can also be seen in the old maps. It is a mapping work of a series view of the city, including the figure of architecture and landscapes painting.



Figure 7 Xi-hu Tu (Painting of Westlake), Painted by Li Song (a famous Shan-shui painter during Song dynasty) Source: http://pic3.nipic.com/20090519/1650358_001554872_2.jpg



Figure 8 Fu-cheng Tu (Map of Hangzhou), 1748 Source: Hangzhou Fu Zhi (Chinese: 杭州府志)

3 SHAN-SHUI CITY: A POSSIBLE ECO-PATTERN FOR MORDERN CHINA?

The case study of Hangzhou city suggests that the instance of Shan-shui city exists, but still one question should be discussed if Hangzhou pattern can be possible in modern time.

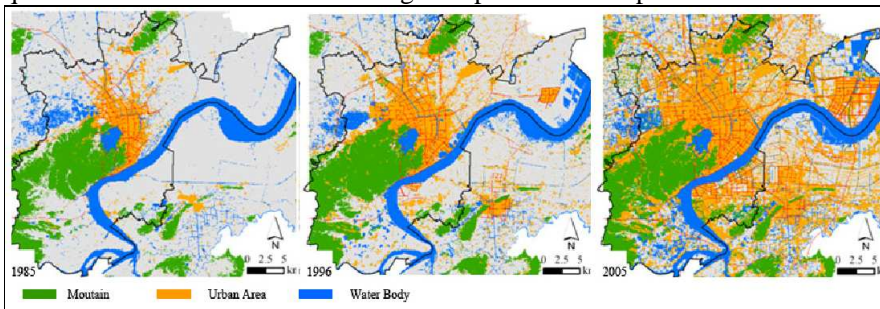


Figure 9 Development of Urban Area in Hangzhou Source: Hangzhou Overall Planning (2001-2020)

With a history of 2000 years, the city has slowly matured and developed, but as a result of rapid development recent years, the expansion speed of urbanization is threatening its balance with nature. The original scale and Mountain-Lake-Urban Form was changed, and one more landscape issue, that of the Qian-tang River, became one important part of the city. A recent way to manage this expansion is by dividing the city into two parts old up-town and new town. The old part was maintained by conservation plan while the new part can be developed over the river. The good balance of determinants was still kept, but one big problem is that without the control of skyline, the view on the urban side is deformed. This result emphasizes the importance of maintaining in the development of Shan-shui city, and with appropriate management the Shan-shui city can be possible and it advices a very sustainable way of planning.

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