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Water Landscape Sequences in Traditional Huizhou Villages: Insights for Modern Planning

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Abstract: Huizhou village has developed a structured water landscape sequence that serves practical purposes, such as drainage and irrigation, but also holds cultural and social importance. This study examines the hierarchy, organization, and distinct features of Huizhou's water landscapes, offering insights for contemporary planning. The sequence is characterized by its hierarchical structure, dynamic water guidance, and ecological adaptability. The paper suggests developing a hierarchical water system to boost the landscape's ecological and cultural value through sustainable design and cultural landscape revival.

Keywords: Huizhou traditional village; Water landscape; Spatial sequence

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1. Introduction

Water landscapes have been shown to play a crucial role in human settlements, managing water resources, regulating ecosystems, and reflecting regional culture. In Huizhou's traditional villages, water landscapes are deeply integrated into daily life through a hierarchical layout, forming a pattern of "villages shaped by water" [1]. The interconnected system of water mouths, ditches, ponds, and streams optimizes resource management while enhancing ecological resilience and cultural identity. However, modernization has led to the simplification of traditional water landscapes, causing functional degradation and loss of cultural significance. This paper examines their spatial sequence, functional roles, and evolution, providing insights for modern sustainable water landscape planning.

2. The water landscape system and sustainable water cycle model of traditional Huizhou villages

The water system landscape of traditional villages in Anhui Province exhibits a hierarchical structure, comprising

outlets, ditches, ponds, and streams (**Figure 1**).

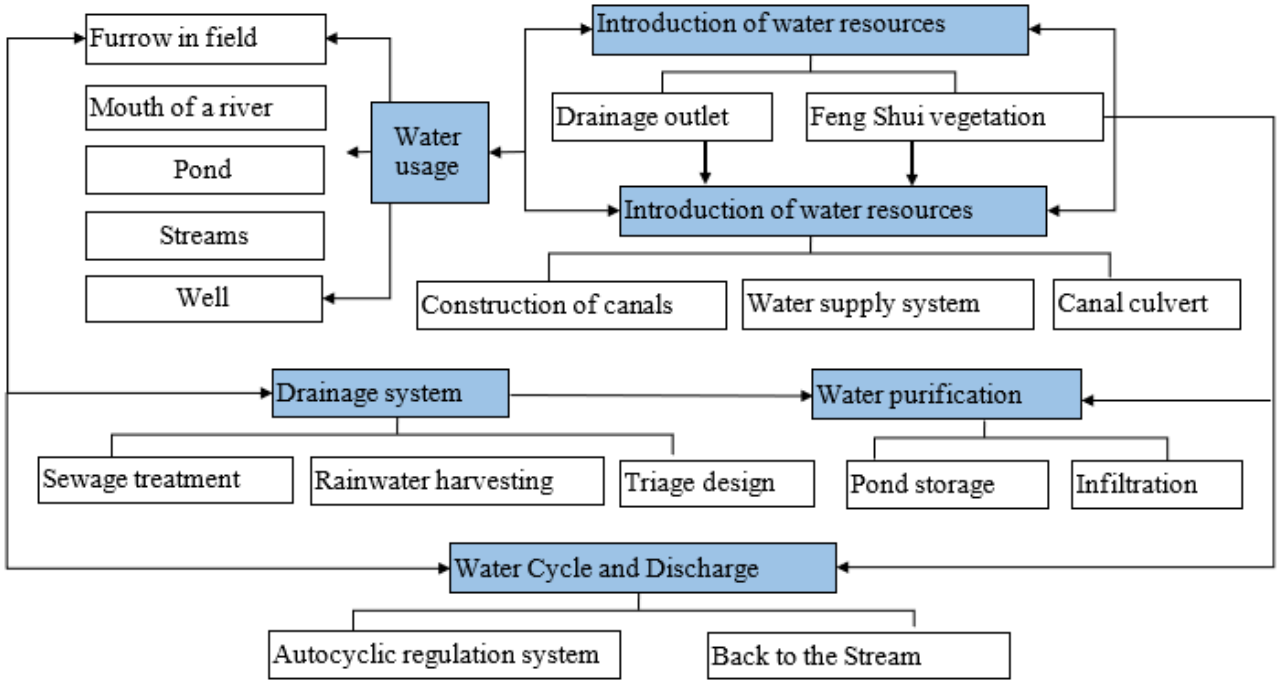

Figure 1. The water landscape of the traditional village of Huizhou continues the water recycling network

This system is adapted to local topographic and hydrological conditions and is managed and recycled in a hierarchical manner. Outlets play a pivotal role in intercepting mountain springs, protecting groundwater, and preventing soil erosion. Fengshui forests contribute to the prevention of sedimentation and the enhancement of water quality. Ponds and wetlands play a pivotal role in rainwater storage and purification, thereby ensuring the stability of the entire system [2]. Ditching is employed for the distribution of domestic and agricultural water, while culverts are utilized to manage excess rainwater, thereby mitigating the risk of flooding. This system maintains ecological equilibrium, with streams contributing to the reduction of flooding, the replenishment of groundwater, and the preservation of the hydrological balance.

3. Spatial sequence of the water landscape in the traditional villages of Huizhou

3.1. Shuikou: Ecological barrier and spiritual landmark

Shuikou represents a pivotal component within the hydrological systems of Huizhou villages, functioning not only as a significant hydrological hub but also as a cultural symbol that incorporates the theories of feng shui, ancestral customs, and ecological perspectives (**Figure 2**) [1]. The architectural design of Shuikou is informed by the principles of feng shui, with the layout of the site being of particular significance. The design is intended to "conceal the wind and gather the water to accumulate wealth", and the site is therefore regarded as the "dragon vein" and the village's primary source of wealth (**Figure 3**) [3]. The layout of the site usually includes a pond, feng shui forest, bridge, temple, and stone inscriptions, forming a landscape that integrates water diversion, feng shui defense, and spatial division. Beyond its ecological functions, shuikou also symbolizes cultural identity and social cohesion, serving as a venue for ritual performances and fostering a sense of community among local residents [4].

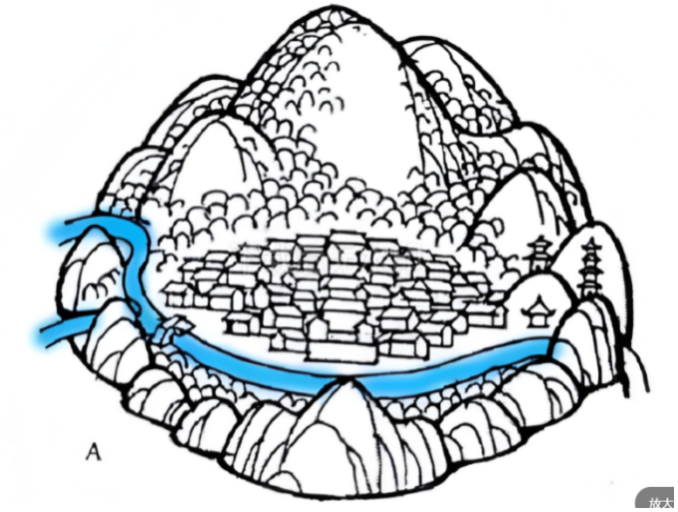

Figure 2. Closed feng shui pattern Source: "Research on Feng Shui Theory"

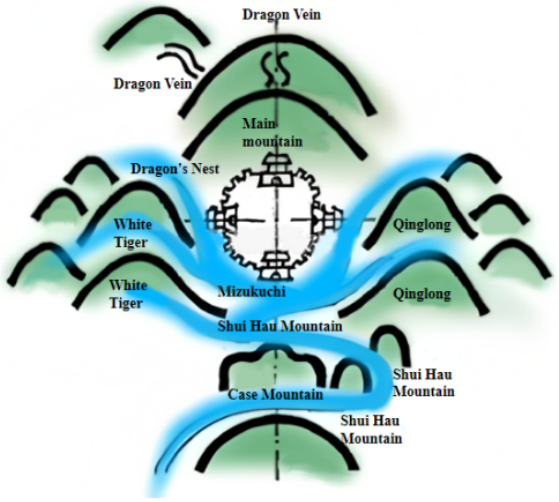

Figure 3. The best location for a village Source: "Research on Feng Shui Theory"

3.2. Aqueducts: A network of flowing blood

In traditional Anhui villages, water channels are regarded as the "blood of life" due to their multiple functions. These include supplying water to the village, irrigating farmland, and preventing flooding through effective drainage. Xidi Village, a paradigmatic example, features a water system that meanders through the village, with ingenious water-diversion mechanisms employed to ensure that "running water in every household" is achieved [3]. Villagers used smart tools like stone troughs, wooden gates, and small dams to carefully control how water moved. This helped them get enough water for farming and daily use. These water channels not only helped manage water well and keep the village safe from floods but also shaped a special cultural scene. This kind of system can give useful ideas for today's water planning in cities and the countryside.

3.3. The reservoir: A central element of public life

Ponds represent multifunctional hubs within Anhui-style villages, embodying a synergy between water management, social and cultural significance [4]. The crescent-shaped Yuechiu in Hongcun, for instance, is integrated with the village water system and surrounded by local buildings, thereby promoting community unity. The design of Yuechiu has shaped how the village is arranged. The pond's calm surface reflects the sky, symbolizing harmony with nature and making it a central space for public life and clan activities. It serves many roles, such as storing water, helping with fire prevention, supporting farming, and being used for rituals. The pond also helps cool the air and brings people together, blending natural, cultural, and everyday functions. This shows how closely Huizhou villages are connected to water in both form and meaning. It serves as a valuable reference point for contemporary water feature design.

3.4. Stream: The border between nature and humanity

In Huizhou villages, streams play a pivotal role in the hydrological systems, acting as a conduit between the natural landscape and human settlements, thereby facilitating ecological, social, and cultural interactions. The topography, village layout, agriculture, and cultural landscapes of the region influence the course and characteristics of these streams. Tangmo Village's Tan Gan Stream exemplifies the integration of natural and artificial water systems,

featuring flexible bank treatments, productive landscapes, and cultural integration. From an ecological perspective, the red sandstone banks and native vegetation of the Tan Gan Stream create a wetland buffer that purifies water and reduces sediment. Functionally, the watermill harnesses water power for grain processing, reflecting the integration of water and village life. Culturally, the filial piety corridor in Tan Gan Garden symbolizes Huizhou's clan traditions and Confucian values.

4. Drawing inspiration from traditional water landscapes for modern landscape planning

4.1. Construct a hierarchical landscape water system

The water features in Huizhou are interconnected by a multi-level water network, comprising the water mouth, gutter, pond, and stream, thus creating a harmonious and interconnected system. This model offers useful ideas for modern water landscape planning. A layered system of "main lake–wetland–stream" can improve both the depth and liveliness of water spaces. The artificial lake acts as the main reservoir. The wetland helps clean the water. The stream serves as a natural buffer. Together, they support a cycle that makes better use of water and helps protect the environment.

4.2. Ecologically sustainable design concepts

The water landscape in Huizhou follows the shape of the land and the flow of water. This setup forms a self-sufficient way to manage water. It fits closely with today's "sponge city" concept, which aims to collect, store, and reuse rainwater naturally to reduce flooding and improve the environment. This offers useful guidance for eco-friendly design approaches [5]. Villages in Huizhou made smart use of water through features like water traps, ponds, and channels. These ideas are helpful for today's urban planning. Using methods like permeable pavement, rain gardens, and constructed wetlands can help manage water better. Permeable pavement lets rain soak into the ground. Rain gardens help clean rainwater. Constructed wetlands act like natural filters and help make city water cleaner. For example, roads or paths that let water pass through can help stop too much water from running off. They let rain go into the soil. Small gardens made to hold rain can clean the water and make it better. Man-made wetlands act like natural ones. They help make the water cleaner and keep the city's water system in better shape.

4.3. Revival of cultural landscapes

The water landscape of Anhui is of great ecological and practical value, carries regional culture, and provides a cultural expression example for shaping the modern urban and rural water landscape. Classical elements of Anhui's water landscape, such as Yueya Pond, Nanhu Lake, arched bridges, and feng shui forests, can be incorporated into urban parks and rural revitalization projects, transforming these water landscapes into cultural symbols that not only enhance ecological benefits but also highlight cultural characteristics [6].

5. Conclusions

The study under scrutiny here demonstrates the hierarchical, ecological, regulatory, and cultural functions of the water features in the traditional villages of Huizhou, thereby confirming their importance in water resource management, environmental sustainability, and sociocultural cohesion. The results indicate that the water mouth-water ditch-water pond-stream system achieves a self-sufficient water cycle, effectively utilizes resources, maintains ecological balance,

and enhances cultural identity. The system's multifaceted benefits, including flood mitigation and community engagement, serve as a compelling source of inspiration for contemporary water landscape planning. Future research endeavors should explore the integration of these elements into modern designs and verify their applicability through empirical and simulation studies to promote sustainable water resource management.

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Disclosure statement

The authors declare no conflict of interest.

Author contributions

Study idea and theoretical framework conceptualization: Mustaffa Hala Ji, Bin Azahari
Case analysis and manuscript writing: Yan Yu

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