Research on the Protection and Utilisation Design Strategy of Hangzhou Traditional Villages on "Three Rivers and Two Banks" from the Perspective of Clusters

Meiqi Wang*, Yidong Sun, Zhe Wu
Zhejiang University of Technology, School of Design and Architecture, Hangzhou, China

Abstract. At the beginning of 2023, Hangzhou launched the "Poetry Road Culture - Three Rivers and Two Banks" Water Golden Tourism Line Project, aimed at revitalizing the countryside in the western part of Hangzhou and creating a model area of common wealth. This article integrates natural and cultural resources on "Three Rivers and Two Banks" in Hangzhou, using kernel density analysis, proximity analysis, and weighted spatial superposition analysis of ArcGIS 10.8 software to classify the traditional villages on "Three Rivers and Two Banks" in Hangzhou into high-resource characteristic villages, intermediate resource characteristic villages, and general resource characteristic villages based on the distribution of resource characteristics. Finally, the traditional villages are examined within a systematic geographical framework to explore the establishment of traditional village cluster protection and development modes and methods. Strategies such as historical excavation, cluster construction, culture and tourism integration are proposed to achieve the goal of coordinating the rational allocation of regional resources, facilitating facility sharing, enhancing the endogenous dynamics of traditional villages, and forming distinctive village brand and cultural groups. This research aims to provide valuable insights for the protection of traditional village clusters.

1. Introduction

The Chinese Party and government attach great importance to rural construction, from the 19th National Congress of the Communist Party of China (CPC), which introduced the strategy of rural revitalization, to the 20th National Congress, which further emphasized the "construction of livable, workable, and beautiful villages." These initiatives underscore the significance of rural development. Hangzhou, as a demonstration zone for common prosperity, Hangzhou initiated the "Poetry Road Culture - Three Rivers and Two Banks" water golden tourism line project in 2023. This endeavor holds great significance in supporting the development of rural areas in western Hangzhou. Traditional villages, as integral components of the countryside, bear a wealth of historical and cultural heritage. Research on the protection and utilization of traditional villages in Hangzhou can infuse vitality into the "Poetry Road Culture - Three Rivers and Two Banks" Water Golden Tourism Route and drive the economic and social advancement of villages in western Hangzhou. However, the current approach to protecting and using traditional villages predominantly focuses on individual cases and single-model development. The innovation is insufficient, the protection and development is unbalanced, and the resources of settlements is slightly lacking. At present, traditional villages have been from the investigation, excavation, protection, entered a new stage: protection and development of both. Feng Jicai, director of the Research Centre for the Protection and Development of Traditional Villages in China, pointed out that traditional villages cannot be protected without development[1]. Consequently, this paper explores the strategy of protecting and utilizing traditional villages on "Three Rivers and Two Banks" in Hangzhou from a clustering perspective, seeking to strike a balance between their preservation and utilization.

2. Conceptual Analysis

2.1. The Concept of Clustering

"Cluster" is an ecological concept, refers to a kind of structural unit in a certain area or environment where various biological species are regularly combined together. This kind of unit has the advantage that the whole is greater than the sum of the individuals. In 1990, Mike Porter introduced the term "industrial cluster" in his book "National Competitive Advantage" to analyze this phenomenon,and believed that "industrial cluster is the spatial agglomeration of a large number of enterprises and associated support institutions in a specific field (usually dominated by a dominant industry) with strong and sustained competitive power[2].
2.2. Traditional Village Cluster Conservation

Its connotation encompasses three key aspects: time, space, and people. Furthermore, it possesses four major attributes: agglomeration, relevance, systematicity, and specificity. Therefore, it is evident that the "cluster mode" for the protection and development of traditional rural settlements should be grounded in a scientific assessment of cluster specificity. Additionally, the trend of cluster agglomeration should be maintained by discerning the primary correlations and constructing a suitable systemic framework. These four characteristics not only underpin the clustered nature of traditional rural settlements but also interact dynamically in a balanced manner.

2.3. Hangzhou's "Three Rivers and Two Banks"

Hangzhou's "Three Rivers and Two Banks" refers to the Xin'an River, the Fuchun River, and the Qiantang River—three main streams covering approximately 231 km. Additionally, it encompasses major tributaries like the Puyang River, Lanjiang River, Danyuanxi, and Banshui River. The term "both sides of the river" pertains to the visible range of the three rivers, extending from the upper reaches of the Xin'an River dam to the lower reaches of the Hangzhou Economic Development Zone and the Great Jiangdong New City. The focus lies on the area from Meicheng to the central city, traversing Chun'an County, Jiaode City, Tonglu County, Fuyang District, Xihu District, the upper city area, Binjiang District, Xiaoshan District, Qiantang District, and other administrative zones (Fig. 1).

3. Historical Evolution of Traditional Villages in Hangzhou's "Three Rivers and Two Banks"

3.1. Origination Stage (Before the Qin and Han Dynasties)

Evidence dating back to 100,000 years suggests the presence of the "Jiande people" in the Jiande area of western Zhejiang, marking the earliest known ancestors of the ancient Yue people. During the pre-Qin period, the Yue tribe held considerable influence in the basin, with the Baiyue culture playing a pivotal role in Zhejiang. The socio-economic development and population growth of the Yue state laid a solid foundation for the emergence and development of settlements in the "Three Rivers and Two Banks" area of Hangzhou in this period.

3.2. Development Stage (Tang and Song Periods)

During the Tang and Song dynasties, the economic center shifted southward, and social development in the southern part of the Yangtze River began to match that of the Central Plains. This region became one of the most economically and culturally developed regions of the country. This period played a crucial role in the formation and development of traditional villages in the watersheds on both sides of the three rivers. A fusion of northern and southern cultures led to distinctive regional characteristics that significantly influenced the construction and development of habitat in traditional villages within the basin.

3.3. The Heyday (Ming and Qing Dynasties)

During the Ming and Qing dynasties, the traditional villages in Hangzhou developed on a large scale. Jiangnan region became an area of abundance, attracting merchants who purchased land and built houses, ancestral halls, temples, pagodas, theaters. This gave rise to a village pattern rooted in clan culture, ultimately evolving into traditional village groups with clans as the core of derivation. Examples include the Tonglu Jiangnan ancient village group and the Jiande Daci Yan Town traditional village group.

3.4. Impact Period (Since the End of the Qing Dynasty)

From the late Qing Dynasty to the Republic of China, foreign cultures exerted a more profound influence, leading to significant impacts on traditional villages. Traditional cultures began to disintegrate, and human settlements underwent alienation. After the founding of the People's Republic of China, numerous traditional villages faced demolition, reconstruction, or transformation into small towns, leading to a decrease in the number of traditional villages. Therefore, the preservation of these traditional villages has become a matter of great urgency.

4. Traditional villages and natural cultural resources of the "three rivers and two banks" in Hangzhou

4.1. Hangzhou's "Three Rivers and Two Banks" Traditional Village Cluster

From 2012 to 2023, the Ministry of Housing and Urban-Rural Development announced the first to sixth batches
of villages listed in the Chinese traditional village list, totaling 8,155 traditional villages. Data screening statistics reveal that there are 54 traditional villages in Hangzhou within the geographical scope of "Three Rivers and Two Banks". Specifically, Xiaoshan District has 3, Fuyang District has 3, Tonglu County has 16, Chun'an County has 13, and Jiande City has 19 traditional villages. This paper focuses on these 54 places as the subject of research and explores strategies for their protection and utilization.

4.1.1. Distribution of traditional villages on "Three Rivers and Two Banks" in Hangzhou

Firstly, we utilized Baidu Maps' address inversion tool (Address inversion is to query the latitude and longitude of the location according to the address information of the location), which retrieves the latitude and longitude of specific locations based on address information. Secondly, we employed a coordinate correction tool to convert the Baidu coordinates to WGS 1984 coordinates. Finally, this data was used to create a distribution map of traditional villages on the "Three Rivers and Two Banks" in Hangzhou using ArcGIS 10.8. (Fig. 2).

Using the Average Nearest Neighbor in the Spatial Statistics Tools of ArcGIS10.8 for operation, the results are as follows: 
\[
\bar{r} = 6924, \quad \bar{r}_e = 8602; R = \frac{\bar{r}}{\bar{r}_e}
\]
that is, the ratio of the actual closest neighbour distance mean value to the theoretical closest neighbour distance mean value R=0.8<1, Therefore, the Hangzhou "Therefore, the traditional villages on both sides of the three rivers tend to be cohesively distributed.

4.1.2. Characteristics of spatial distribution of traditional villages in Hangzhou's "Three Rivers and Two Banks"

From a macroscopic perspective, traditional villages can be considered as point-like elements. Generally, the spatial distribution of point-like elements can be categorized into three types: uniform, random, and cohesive, which can be identified using the closest neighbor index. The nearest neighbour index R is a geographic indicator that represents the ratio of the actual closest neighbour distance to the theoretical closest neighbour distance. Its formula is as follows:

\[
R = \frac{\bar{r}}{\bar{r}_e} = \frac{2\sqrt{5}}{\pi} \sum \frac{1}{d^2}
\]

(Formula: \(\bar{r}\) is the actual nearest neighbour distance; \(\bar{r}_e\) is the theoretical nearest neighbour distance; D is the point density.) When R=1, it means that the point distribution is random; when R>1, the point elements tend to be uniformly distributed; when R<1, the point elements tend to be cohesively distributed.

4.2. Characteristics of Natural and Cultural Resources Clustering on "Three Rivers and Two Banks" in Hangzhou

The foundation for clustering lies in the thorough excavation and systematic organization of historical and cultural heritage resources within the region, establishing a comprehensive protection system from point to surface. The protection and utilisation of traditional villages are closely related to spatial natural and cultural resources. The excavation of the spatial resource elements in Hangzhou's "Three Rivers and Two Banks" serves as the basis for the protection and development of clusters. To gather pertinent information, we referred to sources such as the China State Administration of Cultural Heritage website, the China National Intangible Culture website, the Zhejiang Provincial Department of Culture and Tourism website, and the Zhejiang Provincial People's Government website. From these sources, we compiled data on historical and cultural towns, historical and cultural villages, cultural heritage units, intangible cultural heritage, scenic spots rated as A level or above, and other relevant information, as presented in Table 1.

<table>
<thead>
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<th>NAME</th>
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<td>historical and cultural towns</td>
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<tr>
<td>intangible cultural heritage</td>
<td>303</td>
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<tr>
<td>A-level or above scenic spots</td>
<td>117</td>
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</table>

By using Baidu map's address inversion tool, we obtained the Baidu coordinates for all traditional villages. Subsequently, employing a coordinate correction tool, we converted these Baidu coordinates into WGS 1984 coordinates. Finally, we conducted our analysis in ArcGIS 10.8.

4.2.1. Historical Towns and Villages

As per the State Administration of Cultural Heritage of China's website, within the "Three Rivers and Two Banks" area of Hangzhou, there is one historical and
Cultural town, Longmen Ancient Town, and six historical and cultural villages. These villages include Shen'ao Village, Maoping Village, Xinye Village, Shangwufang Village, Licun Village, and Qinchuan Village. Primarily situated in Jiande City, Chun'an County, and Tonglu County, Daci Yan Town in Jiande City boasts the highest count, with three historical and cultural villages (Fig. 3).

4.2.2. Unit of cultural heritage conservation

Hangzhou's "Three Rivers And Two Banks" region has 33 national cultural heritage units and 62 provincial cultural heritage units 191 municipal cultural heritage units. Using ArcGIS 10.8 software, the five districts and counties containing traditional villages—Chun'an County, Jiande City, Tonglu County, Fuyang District, and Xiaoshan District—were analyzed in terms of kernel density for national, provincial, and municipal cultural heritage units. The results reveal that national units are concentrated in Jiande City and Xiaoshan District (Fig. 4).

4.2.3. Intangible Cultural Heritage

There is a total of 303 intangible cultural heritage items in Hangzhou's "Three Rivers and Two Banks" region, based on incomplete statistics. As there are no traditional villages within the geographical scope of West Lake District, Shangcheng District, Binjiang District, and Qiantang New District, ArcGIS 10.8 software was employed for kernel density analysis of intangible cultural heritage items in the remaining five areas. This analysis revealed that Tonglu County, Xiaoshan District, and Fuyang District exhibit the most concentrated intangible cultural heritage, followed by Chun'an County and Jiande City. Further analysis of national, provincial, and municipal intangible cultural heritage showed that national-level items are primarily concentrated in Fuyang District and Chun'an County, provincial-level intangible cultural heritage is centered in Tonglu and Fuyang, while municipal-level intangible cultural heritage is clustered in Tonglu, Fuyang, and Xiaoshan Districts (Fig. 5).

4.2.4. A-level or Above Scenic Spots

According to the data released by the Department of Culture and Tourism of Zhejiang Province in 2020, there are 117 scenic spots above A level in the area of Hangzhou's "Three Rivers and Two Banks". Among which there are 6 5A scenic spots, 51 4A scenic spots, 44 3A scenic spots and 16 2A scenic spots. Using ArcGIS10.8 software for nucleated density analysis, we observe that the distribution of scenic areas primarily centers around three key regions: the core being the West Lake scenic area, with additional clusters in Fuyang-Tonglu, Chun'an-Jiande, and the eastern portion of Chun'an.Notably, the prominent 5A-level scenic spots include the West Lake Scenic Spot and the Chun'an Thousand Island Lake Scenic Spot (Fig. 6).
5. Characteristics of Traditional Village Resource Clustering and Classification of Protection and Utilisation on the "Three Rivers and Two Banks" of Hangzhou

5.1. Resource agglomeration characteristics

Through yaahp software, we determined the weights for natural and cultural resources, (Table 2). Next, we used ArcGIS 10.8 software to perform a spatial superposition analysis that involved weighting traditional villages and various types of resource elements to reveal agglomeration characteristics (Fig. 7). This analysis ultimately indicated that the natural and cultural resources along the "Three Rivers and Two Banks" in Hangzhou is primarily concentrated in the areas of Jiande City and Fuyang District.

<table>
<thead>
<tr>
<th>Name</th>
<th>Weight Value</th>
<th>Name</th>
<th>Weight Value</th>
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<td>5A and 4A Scenic Areas</td>
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<td>Municipal Intangible Cultural Heritage</td>
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<td>3A and below scenic spots</td>
<td>0.0115</td>
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</table>

5.2. Classification of traditional villages for conservation and utilisation

According to the spatial resource superposition analysis map of natural and cultural resources of traditional villages in Hangzhou’s "Three Rivers and Two Banks", and the application of proximity analysis methods, we can summarize and analyze the distribution of resource characteristic in these villages. They can be categorized into high resource characteristic villages, intermediate resource characteristic villages, and general resource characteristic villages (Fig.8). These categories correspond to priority, key, and general protection and use villages.

It has been found that there are 11 high resource characteristic villages, 17 intermediate resource characteristic villages, and 26 general resource characteristic villages in Hangzhou’s "Three Rivers and Two Banks". Priority protection and use of traditional villages with various resources show high eigenvalue agglomeration, while the grade of the resource, abundance and contiguity, the influence of the village is well, these villages are prioritized for protection and use. The intermediate resource characteristic villages means that the traditional village and one of the resources are clustered with high eigenvalues, and the other resource is clustered with low eigenvalues or has no significant features, while the grade, abundance, contiguity and influence of the resources are still good, and the village will be targeted for conservation and utilization after the advantages have been identified and the values have been refined. General protection and use type means traditional villages and two resources show no significant clustering characteristics, while the resources are more dispersed and more difficult to organize, so these villages are subject to regular protection and use.

6. Protection and Utilisation Strategies of Traditional Villages on the "Three Rivers and Two Banks" in Hangzhou

6.1. Mining History To Identify Spatial Features

Based on the preceding analysis of traditional villages in Hangzhou's "Three Rivers and Two Banks" region, it's evident that high-resource characteristic villages possess abundant natural and cultural resources. These corresponding resources should be used reasonably to foster the development of intellectual property (IP) and drive economic growth in the surrounding areas. As an illustrative example, Xinye Village, a high resource characteristic village boasting a national cultural heritage unit—the Xinye Village vernacular architectural complex. With a history spanning over 800 years, Xinye Village still preserves more than 200 Ming and Qing Dynasty-era buildings, along with 16 ancestral halls, pagodas, pavilions, and other distinctive structures, earning it the moniker "China's open-air museum of Ming and Qing Dynasty architecture." In 2016, Xinye Village gained...
widespread recognition as a filming site for China's popular TV show, "Where's Dad." Leveraging its popularity and rich historical and cultural resources, we can explore opportunities to develop the tourism industry, including themed tours that showcase Xinye Village's architectural heritage. This can lead to the creation of an architectural IP for Xinye Ancient Village, spurring economic development through tourism, specialized services, and unique handicrafts.

For villages with higher resource characteristic, we can conduct a thorough analysis of their strengths and weaknesses. By capitalizing on their respective strengths, we can generate synergistic effects. For instance, villages like Huanxi Village, Xu Fan Village, and Dipu Village in Tonglu County, Jiangnan Township, possess a wealth of cultural heritage and house numerous ancient architectural clusters. However, their visibility remains relatively low. To address this, we can establish connecting routes between these villages using a "point-line-surface" approach to develop the tourism industry. This "point-line-surface" framework can significantly boost regional development.

For general resource characteristic villages, the resource advantages of these villages are relatively insignificant, which need to delve deeply into their potential. Simultaneously, they can make use of their geographic advantages to integrate with the neighbouring villages with high resource characteristics for synergistic development. For example, Liye Village, Shuangquan Village and Chendian Village located in Daciyan Town of Jiande City can jointly interact with Li Village, Xinye Village and Shangfang Wu Village, which are also located in Daciyan Town but brimming with resources, to jointly create a traditional village cluster within Daciyan Town, fostering regional development.

6.2. Integration of resources to build a cluster system

The Hangzhou’s "Three Rivers and Two Banks" region carries thousands of years of historical and cultural imprints, with numerous cultural heritage units, historical and cultural towns and villages, traditional villages, and intangible cultural heritage are inevitably the result of multicultural intermingling. To safeguard and transmit this precious cultural lineage, a spatial system for protection and development should be constructed following the "cluster-group-characteristic" structure, relying on the principle of "Mining History - Classified resource - characteristick group - industrial chain - Characteristic group - Building industrial chain - synergistic development" development mode, and finally form "One Axis - Three Districts - Four groups - Multiple core" cluster structure (Fig.9) fostering synergistic protection and development.

The "One Axis" refers to the "three rivers" as the central axis, while the "Three Districts" comprise the Xin'anjiang Cultural District, Fuchunjiang Cultural District, and Qiantangjiang Cultural District. The "Four Groups" encompass traditional villages in Jiangnan Town, Daciyan Traditional Villages in Daciyan Town, traditional villages in the northern part of Qiandao Lake, and traditional villages in the western part of Qiandao Lake. "Multiple core" refers to the development of traditional villages with high resource characteristic villages as their core.

![Fig.9. Structure of Traditional Village Clusters on the "Three Rivers and Two Banks" in Hangzhou](image)

The protection and development of traditional village clusters should be implemented in a way that promotes the complementarity of resource advantages and the sharing of infrastructure and tourism services in the clusters[5]. To unlock the complementary resource advantages and foster industrial clustering among traditional village clusters, it is crucial to establish connections between villages, leveraging strengths in land use, ecology, landscape, agriculture, and tourism. This will prevent homogenous development and disorderly competition among villages through strategic facility configuration, route planning, and resource coordination. For instance, within the Daci Yan Town traditional village cluster, high resource characteristic villages, those with intermediate resource characteristic villages, and those with general resource characteristic should interdependently utilize regional, industrial, cultural, and talent resources, along with effective integration of labor, capital, and other factors in the market. This will facilitate efficient regional collaboration, and make the optimization of the enhancement of the clusters, enhance the function of self-blood-creation of villages. Externally, a multi-dimensional transportation system encompassing railways, highways, and waterways will be further developed to ensure the complementary utilization of tourism resources and foster interaction between tourism origins and destinations within neighboring clusters.

6.3. Integration of culture and tourism to realise the development of traditional villages under protection

6.3.1. Shaping tourism with culture

As early as 2013 foreign scholars have been concerned about the tourism development and use of non-heritage[9]. Hangzhou boasts a wealth of natural, historical, and cultural resources on both sides of the Three Rivers, as well as renowned tourist attractions,
including the West Lake Scenic Spot, the hermitage of Huang Gongwang, Yan Ziling's fishing platform, the Daci Yan Scenic Spot, and the Thousand Island Lake Scenic Spot, among others. Additionally, the region is home to intangible cultural heritage treasures such as Yan Dongguan's five-skin brewing techniques, Chun'an's triangular drama and more. It also hosts national cultural heritage units like the site of the Cross-Huqiao Bridge, the kiln sites of Jiaotanxia and Tiger Cave, the kiln site of Maowanli, the site of Wugu Cave, the site of the Sizhou Papermaking Workshop, the Xishan Bridge, the vernacular architecture of Xinye Village, and the South Summit Pagoda and North Summit Pagoda of Meicheng. These cultural heritages can be well used to form cultural brands. This approach will not only promote the preservation and development of traditional villages on both sides of the Three Rivers in Hangzhou but also facilitate the coordinated development of cultural resources within clusters. so as to realize the expansion of scale and the creation of brand IP.

6.3.2 Highlighting Culture through Tourism

Leveraging transportation hubs such as bus stations, railway stations, underground stations, and other urban focal points, we can utilize outdoor sculptures, landscape installations, horticultural landscaping, and advanced technologies to infuse Hangzhou's cultural heritage into the urban space. By incorporating elements of public art, we can vividly portray the culture of the "Poetry Road Culture"—the historical characters, folklore, traditional theater, acrobatics, and various skills that have enriched the history of both sides of the Three Rivers. This will enhance the cultural appeal and aesthetic quality of public facilities and urban furnishings. Promoting cultural connectivity and innovation among traditional villages, we can organize special folk events celebrating the "Poetry Road Culture", enriching the cultural significance and influence.

Making the most of Hangzhou's rich cultural and tourism resources within the "Three Rivers and Two Banks" region, we can foster cultural and tourism integration to extend the traditional villages' "industry chain" and promoting consumption. We can craft a range of immersive, diversified cultural and tourism resources within clusters. so as to realize the expansion of scale and the creation of brand IP.

7. Conclusion

Based on the theory of cluster conservation, the article discussed the conservation and utilisation strategy of traditional villages in Hangzhou's "Three Rivers and Two Banks" region. It has meticulously analyzed the region's natural and cultural resources, subsequently categorizing the traditional villages within this expansive area into high resource characteristic villages, intermediate resource characteristic villages, and general resource characteristic villages, presented protection and utilization strategies tailored to these distinct categories. Furthermore, within the geographical scope of Hangzhou's "Three Rivers and Two Banks," a village unit structure has been established along the route, with the Xin'an River, Fuchun River, and Qiantang River forming integral cultural units. This construction has given rise to a comprehensive system of regional resource integration. Employing methods such as historical excavation, resource integration, and the fusion of culture and tourism, a line of tourism synergy development has been established, facilitating the creation of brand products offering diverse experiences. It is our hope that these efforts will not only contribute to the preservation and inheritance of the rich history and culture of Hangzhou's "Three Rivers and Two Banks", but also strengthen the region's core capabilities.

References