

Construction of Multiple Paths for the Living Protection and Utilization of Traditional Villages: A Case Study of the Zhoutie Traditional Village in the Taihu Lake Area

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ABSTRACT: China is a vast country with a wide range of geographical and cultural differences, unbalanced economic development of traditional villages and housings, shortages in infrastructure and people's living conditions, prominent environmental and ecological problems, and an urgent need to improve the overall level of rural development. For a long time, the protection and utilization of traditional villages have mostly been based on the cognitive views of "frozen protection" and "one-sided protection", prompting difficulties and resistance in practice. Meanwhile, the result is not effective. At present, traditional villages encounter the situation of declining, hollowing out, and aging. Therefore, it is the theoretical frontier of traditional village research to get rid of the traditional one-sided and frozen protection model. Research should explore the living protection and utilization methods adapted to the characteristics of traditional villages and promote the close integration of traditional village protection and utilization with new development and construction.

Under the background of rural revitalization strategy and solving the critical problems of a lack of vitality, the decline and hollowing out of traditional villages are caused by "frozen" protection strategies. This is based on the extensive research and continuous study conducted by the "Key Technology and Integrated Demonstration for the Living Protection and Utilisation of Traditional Villages" of the "13th Five-Year Plan" key research project, especially the in-depth study of traditional villages around Taihu Lake. From the perspective of integrated development, it recognizes the dynamic interactions among the industrial status (production), regional natural resource (ecology), and historical living conditions (living). This can help fully coordinate industrial development and improvement of the living environment and ecological construction. Thus, traditional villages can obtain endogenous power for sustainable development. It also reveals that living protection and utilization are embodied in a systematic and orderly protection system under the simultaneous development of spatial dimension and temporal dimensions.

In the protection system, the coordinated development of spatial and temporal dimensions attaches importance to both the overall protection of the material space of traditional villages and the synergistic development of intangible culture and traditional villages in the time dimension. Its objective is to make the protection and utilization of traditional villages and the peoples' daily lives mutually promote each other, enhance the villagers' happiness and sense of achievement, and realize the sustainable development of traditional villages. For the theoretical approach, a multi-level path of living protection and utilization is constructed by combining spatial and temporal dimensions. Among them, the multi-level path in the spatial dimension is composed of three levels: the overall village layout, the individual building, and the indoor environment. The ephemeral path in the temporal dimension is progressively promoted by combining the immediate, medium, and long term, with intertwined interactions of the paths in temporal and spatial dimensions to achieve the living protection of traditional villages. Finally, the practical application of the above-mentioned mul-

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multiple paths is elaborated by taking the Zhoutie traditional village demonstration project in the Taihu Lake area as an example. Both perspective and practical explorations are conducted.

This study is on the construction of multiple paths of traditional villages in temporal and spatial dimensions with an elaboration of the Zhoutie traditional village in the Taihu Lake area. It is an example that will be a positive reference for the research and practical application of the protection and utilization of traditional villages in different regions of China towards an overall and dynamic ‘living’ protection and utilization model. Therefore, this study contributes to building traditional villages to gain continuous endogenous power and promote the sustainable development of traditional villages.

KEY WORDS: traditional villages; living protection and utilization; multiple paths; multi-level paths; ephemeral paths

Introduction

In China, the vast geographical diversity, differences in regional cultures, traditional villages, and residential architecture, uneven economic development, significant shortcomings in infrastructure and people’s livelihood, as well as prominent environmental and ecological issues, all highlight the urgent need for overall improvement in rural development. For a long time, traditional village conservation and utilization have mostly adhered to the cognitive viewpoints of “frozen protection” and “one-sided protection,” which have brought many difficulties and obstacles in practice, resulting in less than ideal outcomes [1]. Presently, traditional villages generally face a severe situation of increasing deterioration, hollowing out, and aging issues. Therefore, how to break away from the traditional one-sided and frozen preservation mode and explore the dynamic conservation and utilization methods adapted to the characteristics of traditional villages [2-6], integrating traditional village conservation and utilization with new development and construction, is at the forefront of current research on traditional villages [7-11].

In recent years, Professor Zhu Guangya’s team at Southeast University, along with the team led by academician Wang Jianguo, conducted a long-term and in-depth tracking study on the traditional villages of Zhoutie in Yixing City, Jiangsu Province, in the surrounding area of Lake Taihu. This study, based on extensive research and continuous studies under the “Thirteenth Five-Year Plan” key research and development project “Key Technologies and Integrated Demonstration of Dynamic Protection and Utilization of Traditional Villages,” constructed a multidimensional path of dynamic protection and utilization integrating spatial and temporal dimensions at the theoretical

and methodological level. In terms of empirical application, using the demonstration project construction of the research team in the traditional village of Zhoutie as an example, the empirical application of the multidimensional path of dynamic protection and utilization was elaborated. The study explores the theoretical construction and practical application methods of the multidimensional path that are forward-looking and practical, which helps traditional villages gain sustainable endogenous dynamics, thereby partly alleviating the problem of hollowing out and achieving sustainable development.

1 Concepts related to dynamic conservation and utilization of traditional villages

1.1 Integration of production, ecology, and livelihood and their relationships with dynamic protection and utilization of traditional villages

Traditional villages have developed their unique physical space and cultural characteristics over thousands of years. The conservation practices of traditional villages in China have evolved from focusing on the preservation of living spaces to emphasizing the protection of living, and ecological spaces, and then to the concurrent protection of living, ecological, and production spaces, that is, the transition from the protection of livelihood to ecology and further to production [12]. Previous extensive research on traditional villages in China indicates that in discussing the dynamic conservation and utilization of traditional villages today, it is insufficient to solely focus on the “conservation” and “utilization” of the villages themselves. Instead, it is essential to adopt a holistic and systematic perspective. Starting from the integrated view of production, ecology, and livelihood, one should understand the influence of industrial conditions (production), regional natural resources (ecology), and historical humanistic

and residential conditions (livelihood) on the formation and development of traditional villages (Figure 1). By studying the overall and dynamic relationships between these factors

and dynamic conservation and utilization, we can then establish diverse pathways for the dynamic conservation and utilization of traditional villages.

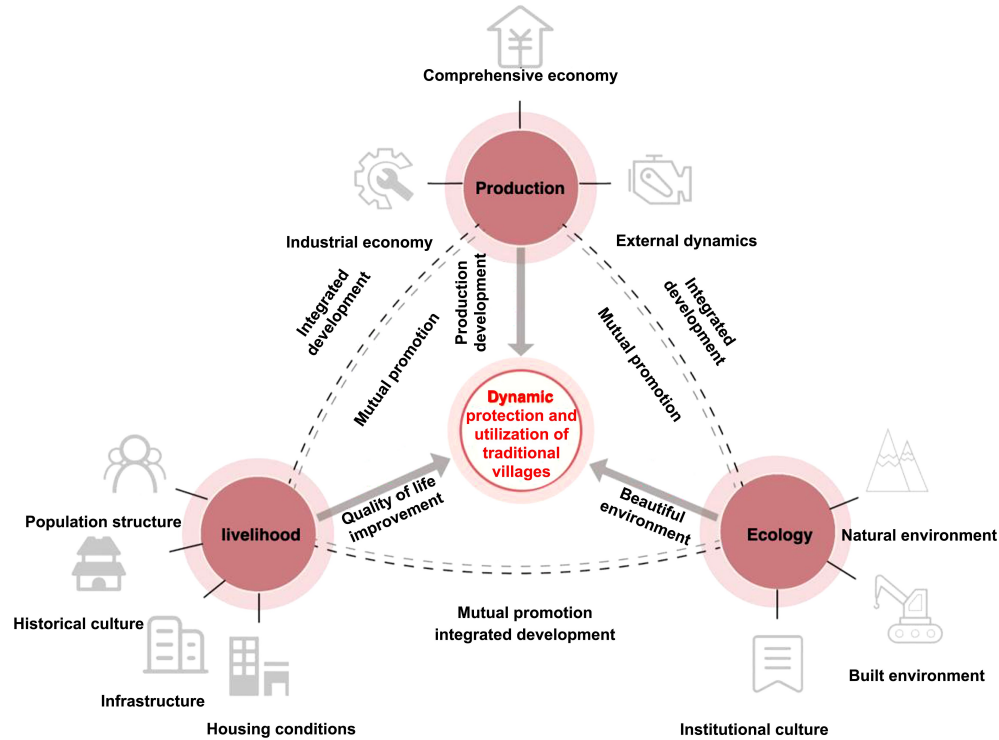


Figure 1 Integration of “three factors” and dynamic protection and utilization of traditional villages

1.2 Connotation of dynamic conservation and utilization of traditional villages

The conservation and utilization of traditional villages have long been a focal point in the field of architecture. In international theoretical research, notable achievements include “development anthropology theory” [13] and “heritage dynamics theory” [14]. In terms of technical methods, representative accomplishments primarily consist of “progressive small-scale renewal” [15] and a “socially driven conservation and utilization model” [16]. At the architectural level, the concept of Adaptive Reuse was formally introduced in the 1979 Venice Charter, defining it as “finding appropriate uses for heritage buildings (i.e., accommodating new functions) to ensure the maximum transmission and representation of the cultural value of the place while minimizing changes to the essential structure of the building” [17]. Domestically, research in this area started relatively later, especially in the realm of traditional villages. In recent years, most studies have been based on a cognitive theory of objective existence and

static conservation, which has to some extent led to a lack of vitality in traditional villages and issues concerning the inhabitants’ sense of belonging. In 2017, academician Wang Jianguo and others proposed that architectural cultural heritage is not a static “frozen” entity but advocates for a dual emphasis on the diversity of heritage conservation and creation [18]. In 2018, the country introduced the strategy of rural revitalization. In this context, the relevant theoretical research and model framework of rural construction need to move away from the original “static” research perspective and conservation model towards a comprehensive and dynamic understanding viewpoint. They are ultimately, approaching the issues of traditional village conservation and development from the perspective of “dynamic vitality” [19-22].

Based on the preliminary research analysis, the dynamic protection and utilization described in this paper embody a systematically ordered spatial dimension of integrated protection and a coordinated development of the temporal dimension as a holistic system. This approach

emphasizes not only the holistic protection of the material space of traditional villages from the perspective of the integration of “three factors” but also focuses on the dynamic inheritance of intangible culture over time and the coordinated development of traditional villages. The goal

is to foster mutual enhancement between the conservation and utilization of traditional villages and the daily lives of villagers, enhancing their sense of happiness and achievement, thereby achieving sustainable development of traditional village development (Figure 2).

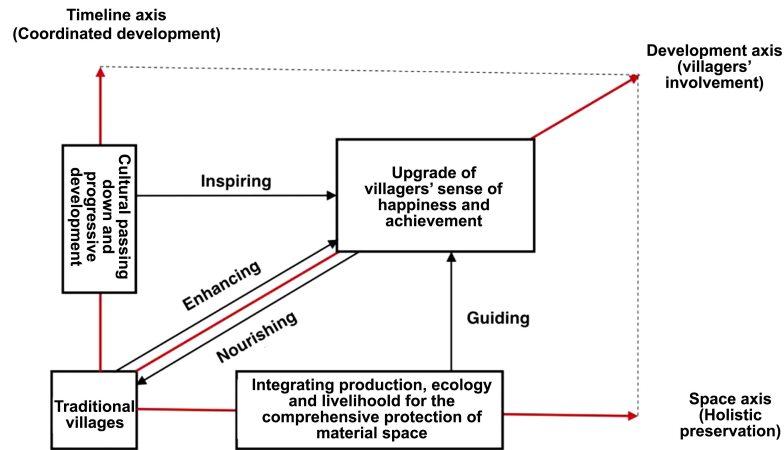


Figure 2 Implications of dynamic preservation of traditional villages

2 Traditional village dynamic protection and utilization: constructing diverse paths

2.1 Traditional village research and data analysis

The research team conducted four intensive surveys on traditional villages in various regions of China through a combination of online and offline methods focusing on the aspects of “production,” “ecology,” and “living.” The online research primarily involved a literature review and case studies, while the offline surveys covered a total of 47 national and provincial-level traditional villages across the country, conducted in four phases. The first phase encompassed 22 national and provincial-level traditional villages in East, Central, South, and Southwest China. The second phase involved detailed research on five national-level traditional villages in Guizhou. The third phase focused on in-depth studies of 17 national and provincial-level traditional villages in the Jiangsu-Zhejiang region around Lake Taihu, with ten of these villages also being recognized as national and provincial-level historic and cultural villages. The fourth phase centered on studying three national-level traditional villages in Shiqian County, Guizhou, totaling over 1,000 collected documents.

During the research, the research team, based on significant differences in traditional culture, geographical en-

vironment, and socio-economic factors across different regions, conducted surveys on villages with different levels, types, heritage conditions, and development potentials. They utilized a combination of literature review, on-site surveys and measurements, and acquisition of data from multiple sources to review the current research systems and achievements, and collect relevant data. During on-site surveys and measurements, various data were extensively collected through field surveys, detailed building surveys, village committee investigations, questionnaire completion, and interviews with villagers. A database was established and data analysis was conducted (Table 1).

Taking the Lake Taihu region as an example, from the perspective of the “Three Factors”, the analysis of research data from 17 national and provincial-level traditional villages revealed that the most distinctive features of the material space in traditional villages often exist in three tiers(as shown in the red frame): First, villages with unique overall layouts and intact preservation, such as Yigao Village in Huzhou, Zhejiang, and Luxiang Ancient Village in Suzhou, Jiangsu, where the surrounding natural landscapes exhibit typical characteristics of the Jiangnan water town, forming a distinctive overall layout closely integrated with the village and natural surroundings. Second, villages with high-quality historical buildings in well-pre-

served conditions, such as the “Three Famous Halls”, including “Renben Hall (provincial-level cultural preservation, abbreviated as Provincial Preservation),” Xinyuan Hall (city-level cultural preservation, abbreviated as City Preservation), and Rongde Hall (city-level controlled preservation, abbreviated as City Controlled Preservation), in Tangli Village, Suzhou, constitute the most prominent feature of the village. Luxiang Ancient Village in Suzhou not only maintains an intact overall layout but also stands out as one of the highest-quality, most abundant, and best-preserved ancient village clusters in the Jiangnan region, with notable features like the Ming Dynasty old street in the village – Zishi Street, and famous buildings such as Huihe

Hall (Wang Ao’s former residence, Provincial Preservation), Suigao Hall (Provincial Preservation), Qianhe Hall (City Controlled Preservation), and Cuihe Hall (City Controlled Preservation). Third, the interior environments of buildings and construction techniques align with local climate characteristics, lifestyle, building technologies, and material forms, demonstrating highly effective and unique practices. Therefore, in constructing diverse paths for dynamic protection and utilization, targeted studies will be initiated based on the most distinctive features of traditional villages in terms of “overall village layout, individual buildings, and interior environments” derived from the research analysis.

Table 1 Sample data compilation form for traditional village survey

The Names of Villages	Geographical Locations	Classification	Grades	Production Status				Living Conditions				Ecological Status		Architectural Features			
				Population:	Income:	Per capita income	Featured Industries:	Completeness of Human Settlement Environmental Facilities	Transportation	Living Facilities	Featured Culture	Vitality	Natural Landscape Environment:	Village Spatial Environment:	Overall Layout	Historic Buildings	Interior Environment and Construction Techniques
Zhou Tie Traditional Village	Yixing City, Jiangsu Province	Plain water network type	Provincial-level traditional villages (National-level historical and cultural towns)	4584 individuals	---	Approximately 13,000 RMB	Well-developed featured industries in celery, lotus root, grapes, nursery planting, aquaculture	General Completeness	Convenient	Complete basic infrastructure, in good construction condition.	The leading town in Taihu Lake flood prevention, a millennium-old port and commercial port, a well-known cultural and educational area in the southeast.	Lack of vitality and vigor	The natural landscape environment features are excellent.	The village spatial environment features are excellent. The grid layout of the cross streets is well maintained.	✓	✓	
Luxiang Ancient Village	Wuzhong District, Suzhou, Jiangsu Province	Plain water network type	National-level traditional villages (National-level historical and cultural villages)	4710 individuals	Exceeding 5 million RMB solely from tourism	Exceeding 15,000 RMB	Well-developed featured industries primarily in tourism and cultural industries, with Su embroidery, tea, loquat, citrus fruits, and other agricultural products as highlights.	High Completeness	Relatively convenient	Complete living infrastructure.	The village hosts a rich cultural life.	Relatively high village vitality	The natural landscape environment features are excellent, surrounded by mountains on three sides, and located by the lake.	The village spatial environment features are excellent, with well-preserved traditional layouts, retaining the overall pattern of 'one street, six lanes, three rivers.'	✓	✓	✓
Tangli Village	Wuzhong District, Suzhou, Jiangsu Province	Mountain resource type	National-level traditional villages	538 individuals	---	---	Well-developed featured industries primarily in agriculture and tourism, with the tertiary industry still in its initial stages.	Relatively High Completeness	Relatively convenient	Relatively complete living infrastructure.	---	Moderate village vitality	The natural landscape environment features are excellent, with a backdrop of mountains and facing the lake, nestled between mountains and waters.	The village spatial environment features are excellent, and the traditional layout of streets and lanes is quite clear.		✓	✓
Yangfeng Village	Changxing County, Suzhou City	Mountain resource type	National-level traditional villages	1453 individuals	Exceeding 1.2 million RMB	Exceeding 30,000 RMB	Well-developed industries focusing on forestry, mineral resource development, and tourism, with a thriving tourism homestay industry.	High Completeness	Very convenient	Complete infrastructure, but lacking a clinic, villagers need to go outside the village for medical treatment.	Red Culture of the New Fourth Army	Insufficient vitality, with few young people returning, but with a significant number of tourists.	The natural landscape environment features are excellent, with forest coverage reaching 80%.	The village spatial environment features are excellent, with the most complete and largest preserved Revolutionary Old Site Group of the Suzhe Military Region, known as the 'Little Yan'an of Jiangnan.'		✓	✓

2.2 Construction of diverse paths for dynamic conservation and utilization of traditional villages

Based on the aforementioned field research and data analysis, a diverse path for dynamic conservation and utilization of traditional villages has been constructed, combining multi-level paths in the spatial dimension and time-based paths in the temporal dimension, as illustrated in Figure 3. The multi-level paths correspond to the holistic protection of the spatial axis within the overall system of dynamic protection and utilization, addressing the optimization of material space, initiating the dynamic protection process of traditional villages, and systematically constructing corresponding paths and methods starting from the three tiers of “overall village layout, individual build-

ings, and interior environments.” The time-based paths correspond to the coordinated development along the temporal axis within the overall system of dynamic protection and utilization, addressing the complex social and economic factors involved in dynamic protection and utilization of traditional villages. They are gradually implemented in stages according to short-term, medium-term, and long-term phased strategies, followed by empirical application in demonstration projects, summarizing and optimizing the diverse paths.

2.3 Multi-level paths

The multi-level paths primarily focus on the optimization of material space, with each of the three tiers of “overall village layout, individual buildings, and interior en-

vironments” emphasizing different aspects while interweaving with each other. This approach can effectively improve people’s living and working conditions, enhance the attractiveness of traditional villages, provide a platform for the development of industrial economy and social culture, and thereby offer intrinsic dynamics for the long-term development of traditional villages, to address some extent the problem of traditional village hollowing.

(1) Overall village layout level

At the level of the overall village layout, government and professional organizations play a leading role. Comprehensive consideration is given to the external landscape characteristics of the village, conducting in-depth research and analysis on elements such as the mountain-and-water layout, general appearance, public spaces, transportation and infrastructure, and industrial conditions. This informs a comprehensive positioning for the dynamic protection and utilization of traditional villages, determining an overall development strategy in conjunction with phased temporal paths for the short-term, medium-term, and long-term.

Building upon the overall positioning, it is essential to conduct in-depth research and quantitative analysis of elements such as spatial structure, public spaces, resident behaviors, infrastructure, and building conditions at the holistic level of traditional villages. This will lead to the formulation of specialized guidelines for village environment, public spaces, infrastructure, building renewal, industrial planning, public services, etc., providing scientific guidance for the construction of subsequent projects.

(2) Individual building level

The advancement of the individual building level typically occurs in the form of spontaneous micro-updates driven by residents, guided by the government and professionals. It consists of two aspects: Firstly, based on preliminary research, a comprehensive evaluation of individual buildings is conducted to develop appropriate preservation and utilization strategies, in line with temporal paths to determine specific contents at each stage. Through the analysis and quantification of factors such as the building’s preservation level, historical value, architectural craftsmanship, relationship with the environment, existing conditions, and

value for preservation and utilization, diverse strategies including prioritizing protection, inheritance, and development are formed based on quantitative evaluations to guide renovation measures for different types of individual buildings.

Secondly, through building surveys, mapping, and typological organization, a database is established containing key information on building structural forms, functional spaces, architectural facades, and traditional craftsmanship components. Targeted guidance is provided for protection and renovation at the individual building level. Through demonstration projects, systematic enhancements are implemented for individual buildings to integrate spatial and physical performance, better serving the current needs of villagers.

(3) Interior environment level

The interior environment is closely linked to residents’ lives, directly addressing the need for cultural heritage continuation and improvement of living conditions for villagers. Typically, residents voluntarily undertake updates in compliance with guidelines and regulations at the village and individual building levels, often in the form of micro-updates. Addressing residents’ needs for health, comfort, safety, durability, and facility improvements, the dynamic protection and utilization of the interior environment level progresses through a combination of short-term, medium-term, and long-term measures. This gradually establishes a beneficial cycle of traditional aesthetics continuation and improvement in residents’ living environments.

2.4 Temporal paths

Temporal paths correspond to the coordinated development along the time axis within the overall system of dynamic protection and utilization, aimed at addressing the complexity and contradictions inherent in the dynamic protection and utilization of traditional villages. They are implemented gradually in stages combining short-term, medium-term, and long-term strategies. Temporal paths intertwine and cooperate with multi-level paths to achieve incremental updates and long-term development of traditional villages.

Whether at the village level, individual building level,

or interior environment level, the short-term path primarily focuses on remedial enhancements based on current village development and residents' living conditions to meet present-day needs, thereby initiating the path to dynamic revitalization. The medium-term path involves a relatively comprehensive enhancement of material spatial environments, incorporating elements of cultural heritage to promote mutual growth and development of traditional village material space and cultural heritage. The long-term path embodies the ideal state where material space is comprehensively optimized, and cultural heritage and material space development complement each other.

From the perspective of integrating the “three factors,” optimizing the material space within the “livelihood” context can initiate the dynamic development of traditional villages. This can effectively facilitate further integration and enhancement of “production” and “ecology” aspects. For instance, fostering the development of rural tourism not only boosts tourism-related handicrafts, agriculture, manufacturing, and services but also promotes the convergence of rural primary, secondary, and tertiary industries into a foundational “mega-industry.” Additionally, rural residents can benefit economically and culturally from the development of rural tourism, encouraging them to actively improve the material spatial environment of villages, and unearth and preserve cultural heritage, thereby achieving the sustainable development of traditional villages [24,25].

3 Practice and application of dynamic preservation and utilization of traditional villages around the Lake Taihu region

3.1 Characteristics, issues, and selection of typical cases of traditional villages in the Lake Taihu region

The Lake Taihu region typically refers to the area centered around Suzhou and includes Wuxi, and Changzhou, as well as counties such as Wujiang, Yixing, Changshu, Kunshan, and Taicang [23]. This region boasts excellent natural conditions and has historically been one of the most prosperous areas in China. The historical and cultural standards of traditional architecture in the Lake Taihu region are outstanding [26], with a significant number of national and provincial-level traditional villages still pre-

served in the region, characterized by relatively well-preserved traditional residential buildings (Figure 4). However, traditional villages in the Lake Taihu region also face challenges such as poor infrastructure, aging and dilapidated housing, and unfavorable living environments. Additionally, the lack of industrial development momentum and the migration of many young people to urban areas has exacerbated the issues of aging and hollowing out of traditional villages, making the task of dynamic protection and utilization urgent.

Building upon the extensive longitudinal research conducted by the research team, an empirical study was carried out on the application of diverse paths for dynamic protection and utilization using Zhoutie traditional village as an example. Zhoutie traditional village is the oldest part of Zhoutie Ancient Town (a nationally recognized historic and cultural town) and has developed a spatial layout centered around the Cross River and Cross Street during its long history (Figure 4). The preservation of buildings in Zhoutie traditional village is relatively good, with two city-level protected buildings, one controlled preservation unit, and 76 historical buildings. The natural environment, spatial layout, development history, and challenges faced by Zhoutie traditional village are broadly representative of the Lake Taihu region (highlighted in the blue box in Table 1). In recent years, driven by major development projects such as the Phase 2 project of Nianhua Bay and the Submarine Tunnel under Lake Taihu, Zhoutie has witnessed significant opportunities for dynamic protection and utilization.

3.2 Overall positioning of dynamic protection for village at the level of the whole village

Based on extensive prior research and data analysis, the research team comprehensively reviewed the production, living, and ecological elements of Zhoutie traditional village (including geographical location, overall layout, village history, folklore, architectural style, public spaces, transportation systems, infrastructure, and industrial conditions). A comprehensive assessment of the current protection and utilization status was conducted. Building upon this foundation and in conjunction with government development plans, a comprehensive study of the overall strate-

gy and methods for dynamic protection and utilization of Zhoutie traditional village was carried out. The overall positioning for dynamic protection and utilization was established, focusing on maintaining a primarily residential functional structure while developing commercial, cultural industries, and tourism based on the inheritance and promotion of material and cultural heritage. The aim is to

gradually restore Zhoutie as a complex entity integrating residential, commercial, and cultural entertainment activities. A phased and staggered implementation path combining short-term, medium-term, and long-term goals was proposed (Figure 5) to provide comprehensive guidance for the dynamic protection and utilization of Zhoutie traditional village.

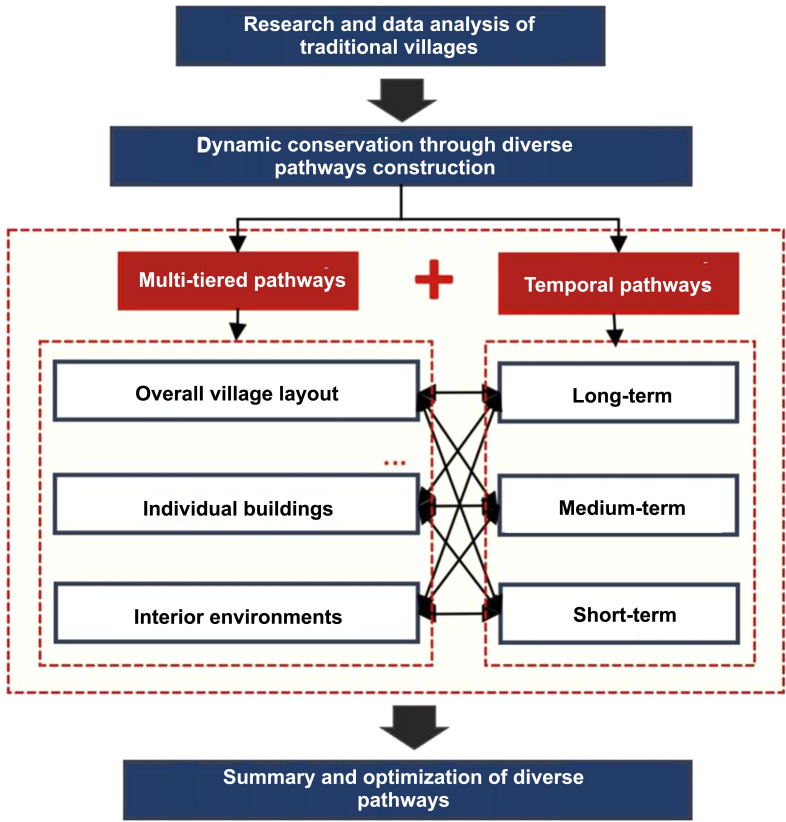


Figure 3 Steps and contents of constructing multi-tiered and diverse pathways in traditional villages

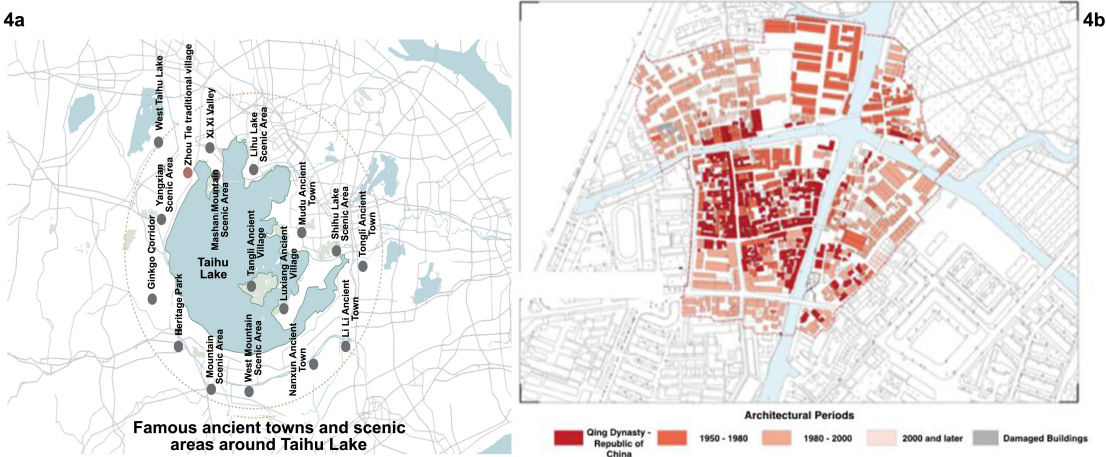


Figure 4a Distribution of famous ancient towns and scenic areas around Lake Taihu region, with the location of Zhoutie traditional village

Figure 4b Overall layout of Zhoutie ancient village

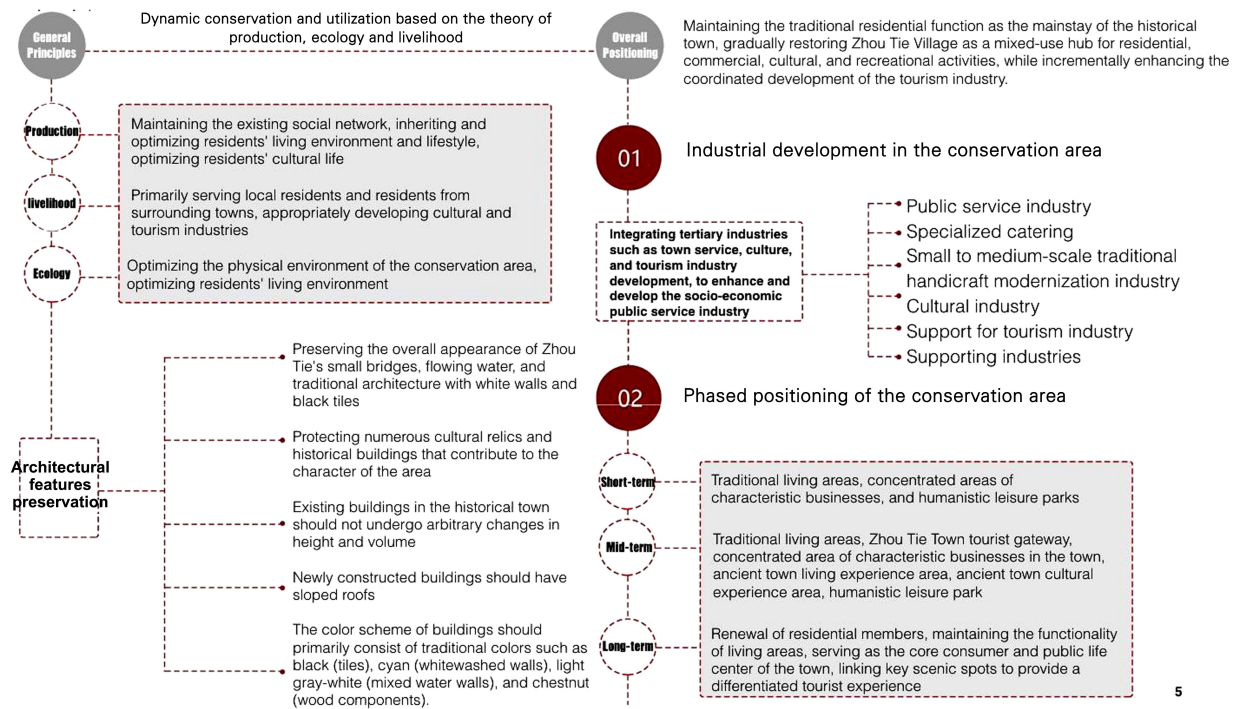


Figure 5 General positioning framework for the dynamic conservation and utilization of Zhoutie traditional village

Building on this overall positioning, specific research and guidelines were developed for the public spaces of Zhoutie traditional village, focusing on the most critical areas in the village spatial layout, such as the north-south streets, east-west streets, and the riverside space along the Cross River, outlining corresponding dynamic positioning

and protection and utilization guidelines (Figure 6).

3.3 Diverse strategies at the individual building level

Taking into account the protection level, architectural value, existing conditions, and potential value for dynamic utilization of current buildings in Zhoutie, a hierarchical classification mechanism was proposed for buildings. The

Primary indicators	Passive waterfront spaces			Transient waterfront spaces	
Secondary indicators	Compact type	Basic type	Expansive type	Public type	Living type
Representative areas					
Existing cross-sections					
Activity planning	Passage	Sketching, rest, communication	Drying, rest, water-related activities	Traditional activities, vending, relaxation	Drying, exercise, nature connection
Optimized cross-sections					

Figure 6 Formulation of special guidelines: dynamic design guidelines for waterfront spaces along the cross river

Analytic Hierarchy Process (AHP) method was employed to evaluate individual buildings. Expert assessments determined the weights of four criteria as follows: historical value (38.74%), architectural art and construction technology (16.53%), architectural environmental relevance (17.02%), and existing conditions with potential for dynamic utilization (27.71%). Ratings were assigned to each building based on the four criteria, and weighted calculations were performed to establish a score for each building. This resulted in a classification of buildings into protected, heritage, and development categories. Diverse protection strategies were tailored for each building type, specifying corresponding utilization guidelines to offer guidance for the dynamic protection and utilization of the various building types (Figure 7). Through comparison and validation with on-site building preservation and utilization cases, it was found that the completed building preservation and utilization cases corresponded well with the protection types and strategies identified by the classification assessment system. Therefore, the evaluation system will be used to guide future demonstration projects and other preservation and utilization practices in the village.

(1) Protected buildings (comprehensive assessment score > 75 points): corresponding to the 2 municipally protected buildings within the village and historic buildings with high evaluation scores. These structures are typically preserved intact according to relevant laws and regulations, with documentation established, listings made public, and their reuse usually government-led. The transformed Zhuxi Academy, depicted in the left image in Figure 7, serves as a typical example of a protective building with a preservation and utilization method led by the government.

(2) Heritage buildings (comprehensive assessment score 50-75 points): corresponding to the majority of the 76 historic buildings within the village. Planning control management is implemented, encouraging protection and reuse under modern needs while preserving the architectural style of protected buildings. Methods such as retention or partial retention are often employed to maintain the architectural character. The facade transformation and spatial updates of street-facing buildings completed under

governmental guidance, as shown in Figure 7, mostly fall under this category.

(3) Development buildings (comprehensive assessment score < 50 points): corresponding to the numerous non-protected and non-historic buildings within the village. These buildings can undergo significant redesign and updates without compromising the overall village aesthetics. For instance, the transformation of a village residential building into a commercial structure completed voluntarily by villagers, as shown on the right in Figure 7, is typically led by the villagers themselves with the government providing necessary guidance and assistance.

As one of the demonstration projects of the research topic, the former supply and marketing cooperative located at the intersection of the southern end of North-South Street and Xueqian Road has been transformed into a new Party and Mass Service Center (village committee), doubling as a comprehensive tourism information center, making it a typical case of development-oriented architectural preservation and reuse. Analyzing from the perspective of diversified path construction, the building transformation aligns with the mid-term renovation path at the individual building level. This public building, dating back to the 1980s, was originally used as a supply and marketing cooperative. During the renovation process, the original spatial layout of the building was largely preserved, the building structure was renovated and strengthened, materials and structures were upgraded, the spatial configuration was improved, auxiliary spaces such as restrooms and storage rooms were introduced, and building equipment was updated. After the transformation, it became a shared space for villagers and tourists, serving multiple purposes including Party and Mass Service Center, village committee, and tourist service center. The research team assisted local authorities and design units in optimizing the street-facing facade design. The original facade form of the building was largely preserved, retaining its original characteristics, while contemporary materials such as stainless steel and wood were introduced at the ground level. This not only provided seating for villagers and tourists to rest and interact but also highlighted the public nature of the building and its contemporary features (Figure 8).

Trends in architectural conservation, inheritance, and development

7a

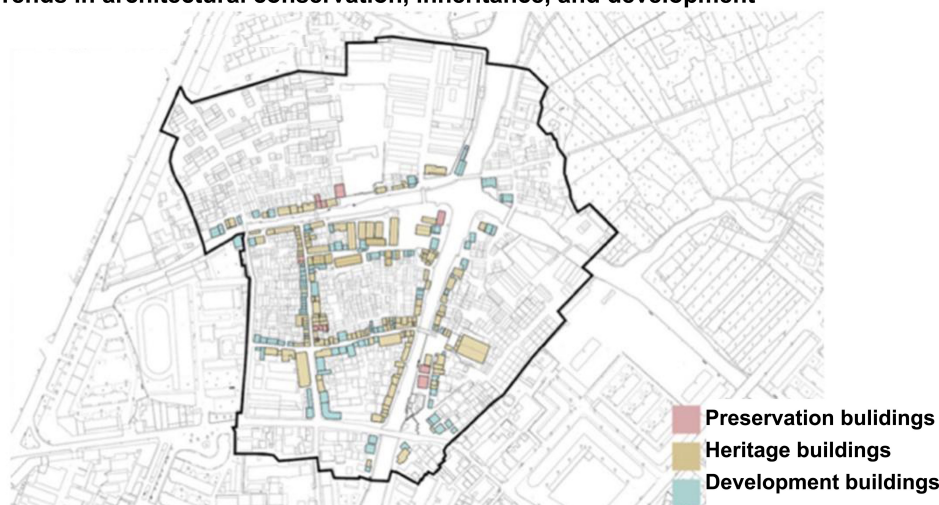


Figure 7a Preservation and utilization strategies for street-side buildings in Zhoutie traditional village

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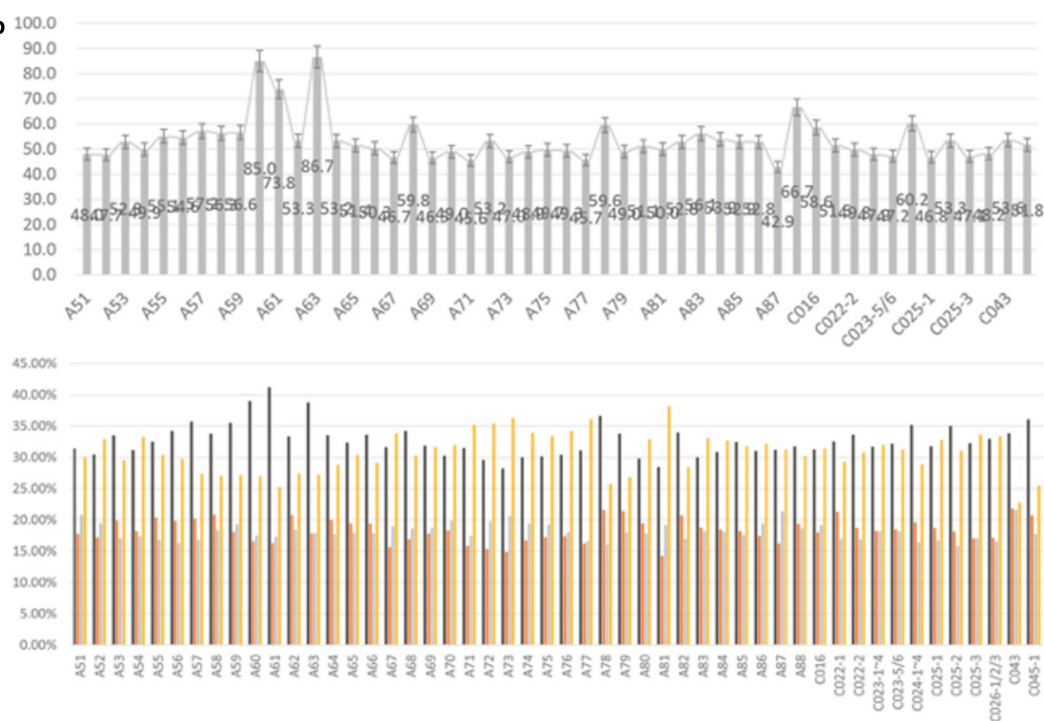


Figure 7b Building score distribution based on the village architectural evaluation system (upper: total score, lower: secondary indicator scores)

3.4 Integrated enhancement of spatial performance and physical performance at the interior environment level

The interior environment level is closely related to residents' lives and is often completed by residents in a self-improvement manner based on relevant regulations, although some public housing renovations require government leadership. During the preliminary research, it was found that the residential buildings in Zhoutie traditional

village commonly suffer from issues such as narrow indoor spaces, poor physical environments in terms of lighting and ventilation, and inadequate facilities, which do not meet the requirements of contemporary living. Taking the residential building shown in the left image of Figure 9 as an example, measurements indicated that the maximum daytime illuminance in the bedroom was only 20lx, whereas according to the current national residential lighting standards, the standard value for bedroom lighting should

be between 75-100lx. Therefore, the primary task in the dynamic protection and utilization of the interior environment level is to improve the living conditions by integra-

ting space design and updating facilities to achieve an integrated enhancement of interior spatial performance and physical performance.



Figure 7c Preservation and utilization of historic building: Zhuxi academy



Figure 7d Heritage buildings: transformation of street-side residential spaces and facades



Figure 7e Development buildings: transformation of village residential buildings into commercial buildings



Figure 8a Zhoutie village community center after renovation

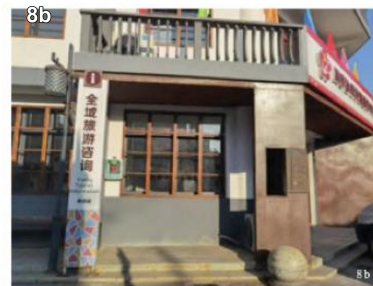


Figure 8b partial facade of Zhoutie village community center after renovation

In the dynamic protection and utilization of the interior environment level, a progressive approach combining short-term, medium-term, and long-term strategies should be adopted, with specific practices as follows:

(1) Short-term preliminary enhancement: primarily serving the current needs of residents, initial enhancements are carried out with temporary remedial measures while attempting to preserve the original spaces and structures. This phase involves simple content, limited investment, but relatively short effectiveness. Key elements include building repairs and structural reinforcements, initial enhancement of building physical performance, optimization of lighting and ventilation design, and appropriate equipment updates.

(2) Medium-term comprehensive enhancement: a relatively comprehensive upgrade carried out while maintaining the current functionality and spatial layout of the building. This phase includes upgrading the materials and structures of the existing building, refining the living space configuration, introducing auxiliary spaces such as kitchen and bathroom storage, initial enhancement of

building physical performance, and updating building equipment.

(3) Long-term comprehensive enhancement: considering the future development of the building while preserving its architectural character, a comprehensive improvement of the internal space is undertaken to meet contemporary functions and usage requirements. This phase involves optimizing interior space performance, integrating internal spaces to meet new life needs, enhancing the physical performance of the indoor environment by optimizing lighting and ventilation design and improving the building envelope structure, optimizing functional spaces such as kitchen, bathroom, and storage, and appropriately adding new equipment and facilities.

The case shown in the right image of Figure 9 is a government-led renovation of a dilapidated building located on the north side of North-South Street. Originally a residential building and categorized as public housing, the structure was on the brink of collapse due to long-term neglect. The government conducted a comprehensive long-term upgrade, transforming it from a purely residential function to a mixed-

use development combining commercial and residential purposes. During the preservation and renovation process, the original facade of the residential building was retained, the existing structure was reinforced and repaired, and comprehensive transformations and upgrades were implemented for the spatial layout, functional configuration, physical performance, and facilities of the building. Following the renovation, significant improvements were achieved in the indoor light-

ing performance. Near window areas experienced a maximum illuminance of 150lx, with an average illuminance of 59lx throughout the indoor spaces, aligning closely with the current national residential lighting standards. The comfort and usability of the interior spaces have significantly improved, better meeting contemporary comfort standards. The building is currently leased to and operated by a teahouse, demonstrating successful dynamic protection and utilization.



Figure 9a Typical interior conditions of residential buildings in Zhoutie village

Figure 9b Comprehensive renovation of residential buildings (converted into a tea house) after renovation

4 Conclusion and discussion

Based on previous research and demonstration projects, this paper, starting from the perspective of the integration of “Three Factors,” constructs a diverse path of dynamic protection and utilization that combines multi-level paths in spatial dimensions and duration paths in temporal dimensions. Taking the traditional village of Zhoutie in the surrounding area of Lake Taihu as an example, this paper elaborates on the practical application of the diverse paths and draws the following conclusions:

(1) Through the lens of the “Three Factors” integration, starting from a holistic and systematic perspective, it is recognized that there is a comprehensive and dynamic relationship between the three key factors influencing the formation and development of traditional villages – industrial status (production), regional natural resources (ecology), and historical, cultural, and residential conditions (livelihood) – and dynamic protection and utilization. This relationship helps in harmonizing industrial development, improving residents’ living environment, and enhancing ecological environment construction, allowing

traditional villages to gain sustainable endogenous dynamics.

(2) This study reveals that dynamic protection and utilization manifest as a systematically ordered spatial dimension of integrated protection and coordinated development in the temporal dimension as a holistic system. It emphasizes not only the overall protection of the material space of traditional villages but also the collaborative development of intangible culture and traditional villages in the temporal dimension. The goal is to promote mutual enhancement between the conservation and utilization of traditional villages and the daily lives of villagers, enhancing villagers’ sense of happiness and achievement, thereby achieving sustainable development of traditional villages.

(3) The paper constructs a diverse path that integrates spatial and temporal dimensions for the dynamic protection and utilization of traditional villages. This path spans multilevel paths covering the overall village, individual buildings, and indoor environments in the spatial dimension, and a duration path combining short-term, medium-term, and long-term perspectives in the temporal dimension.

sion. These dimensions intertwine and promote each other, collectively advancing the holistic dynamic protection and utilization of traditional villages. Through the optimization and summary of demonstration projects, forward-looking and practical ideas are proposed.

The research on the multi-path construction of traditional villages in terms of temporal and spatial dimensions in this paper, along with the detailed explanation using the traditional village of Zhoutie in the surrounding area of Lake Taihu as an example, will contribute positively to the development of an integrated and dynamic “dynamic” conservation and utilization mode for traditional villages in various regions of China, promoting the sustainable development of traditional villages.

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Figure and table sources

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References

[1] CHANG Qing. A Perspective of the Traditional Settlements from

Ancient to Now: Commemorating the Ninetieth Anniversary of the Society for Research in Chinese Architecture[J]. Architectural Journal, 2019(12): 14-19.

[2] SUN Shiwen, WU Tinghai, WANG Fuhai, et al. Vigorous city and Countryside, Beautiful Human Settlements[J]. City Planning Review, 2020, 44(1): 92-98, 116.

[3] WANG Xiaoming. Practices and Reflections on the Value Recognition and Holistic Protection of Traditional Villages[J]. Journal of Southwest Minzu University (Humanities and Social Science), 2013, 34(2): 156-160.

[4] LIU Jingping, XU Xiaodong. Quantitative Analysis of Driving Factors and Their Influences in the Spatial Structure Evolution of Typical Villages in Southern Jiangsu Province[J]. Journal of Human Settlements in West China, 2019, 34(5): 40-48.

[5] CHEN Weixuan, CHU Jinlong, CHEN Jiteng. Developing a Typology of Traditional Villages and Corresponding Policy Guides: Research Based on 92 National-Level Traditional Villages in Huangshan City[J]. Development of Small Cities & Towns, 2018, 36(9): 108-117.

[6] LOU Senyu. A Study on the Model of Revitalization and Renewal of Traditional Villages: A Case Study of Siping Village in Tangxi Town, Jinhua City[J]. Village Technology, 2018(30): 34-35.

[7] ZHONG Liqiang, WANG Yujie, WANG Zhu. The Emerging Orders and Evolution Mechanism of Rural Patterns[J]. New Architecture, 2017(3): 84-87.

[8] ZHANG Xingfa, WANG Qingsheng. Research on the Protection and Inheritance of Traditional Village Culture Based on the Activation and Utilization of Heritage[J]. Tianjin Agricultural Sciences, 2018, 24(9): 35-39, 69.

[9] OUYANG Guohui, WANG Yi. On Protecting Dynamically Traditional Villages in China[J]. Journal of Changsha University of Science and Technology (Social Science), 2017, 32(4): 148-152.

[10] WANG Guodong. Progress Research on Protection and Activation of Traditional Village at Home and Abroad [J]. Journal of Minjiang University, 2018, 39(3): 46-54.

[11] XU Xiaodong, ZHANG Wei, BAO Li, et al. Adaptive Design and Practical Strategy of Rural Industry in the Context of Rural Revitalization: The Case of Qianji Village, Banzhuang Town, Lianyungang[J]. Journal of Human Settlements in West China, 2020, 35(6): 101-107.

[12] HU Siting, LI Ming. A Study on the Overall Conservation of Traditional Villages in the Chaohu Lake Area from the Spatial Perspective of “Three Factors”: The Case of Hongtong Village [J]. Journal of Anhui Academy of Governance, 2019(2): 69-76.

- [13] CHEN Qingde. Development Theory and Development Anthropology[J]. Thinking,1998(8):48-53.
- [14] WANG Qiong, JI Hong, CHEN Jinguo. A Study on the Dynamics of the Preservation and Vitalization of Villages Based on Three Cases in Fujian[J]. Architectural Journal,2017(1):108-112.
- [15] LI Wanjun. Exploring the Small-scale and Progressive Regeneration of the Historical and Cultural District of Gate of Heaven in the Context of Urban Double Repair[J]. Business & Luxury Travel,2019(9):229-231.
- [16] XU Fei, DAI Rui. A Study of the Social Dynamics of Ideological and Political Education Content Change[J]. Studies in Ideological Education,2018(7):13-18.
- [17] ZHANG Chaozhi, LIU Shixia. Urban Renewal and Heritage Adaptive Use: the Role and Function of Tourism[J]. Urban Insight,2016(5):139-146.
- [18] WENHUI News, Culture/Spotlight Column [N, 2017-4-12[2021-4-18] http://dzb.whb.cn/html/2017-04/12/content_543210.html.
- [19] ZHANG Tianxin, WANG Min. On the Possibility of Living Culture Criteria in Chinese Village Heritage Conservation—Comparison between the Criteria of UNESCO Asia-Pacific Awards for Cultural Heritage Conservation and Chinese Traditional Villages[J]. Chinese Landscape Architecture,2015,31(4):46-49.
- [20] WU Jinxiu, DONG Wei, LI Yonghui, et al. Old Housing, New Life Preservation and Renewal of Nanjing Zhongnongli Minguo Residential Area Based on Progressive Performance Upgrading[J], Architectural Journal,2013(8):99-103.
- [21] YE Lu, HUANG Yiru. A Study on the Relevance between the Rural Construction and Design Intervention after the Founding of the People's Republic of China[J]. New Architecture,2020(5):89-93.
- [22] WU Lian, YU Kanhua, YU Xiaohui, et al. Research on the Revitalization Path of Production-Living-Ecological Space of Typical Villages in Qin-Ba Mountainous Area: A Case Study of Rural Revitalization Planning of Huayuan Village in Shangluo City[J]. Planners,2019,35(21):45-51.
- [23] Ministry of Housing and Urban-Rural Development, The Interpretation And Inheritance Of Traditional Chinese Architecture (JiangsuVolume)[M]. Beijing: China Architecture & Building Press,2015.
- [24] WEI Cheng, CHENG Yuxiao, ZHONG Zhuoqian, et al. Research on Implementation and Management Evaluation System of Protection and Utilization of Traditional Villages: A Case Study of Chinese Traditional Village in Lingnan Waterfront[J]. South Architecture,2022(4):46-53.
- [25] LIN Runze, YANG Fan, ZHANG Dan, et al. Landscape Feature Extraction and Floristic Division of Traditional Villages in the Minjiang River Basin[J]. South Architecture,2022(4): 54-60.
- [26] Suzhou Garden Development Co. Suzhou garden building techniques[M].Beijing:China Architecture & Building Press,2012.