

Research on the Protection Strategies of Traditional Villages in Southern Guizhou from the Perspective of Spatial Genes: A Case Study of Zhelü Buyi Ancient Stockade in Binghua Village

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Abstract

The evolution of spatial forms in traditional villages encapsulates a wealth of cultural information pertaining to regional, ethnic, and ecological contexts. Highlighting local characteristics and perpetuating rural cultural heritage are pivotal for the revitalization of rural culture in China. This study, focusing on the Lübuyi Ancient Village in Binghua Village, investigates the spatial morphology of traditional villages in Southern Guizhou from the perspective of spatial genes. It comprehensively explores the continuity of spatial forms in traditional villages, constructs a genealogical framework of spatial genes, and proposes strategies for the inheritance of spatial genes in response to existing challenges. The study aims to provide references for the protection and development of traditional villages in Southern Guizhou, offering new research perspectives for the inheritance of traditional villages and promoting the synergistic development of organic inheritance and modern spatial environments.

Keywords

Spatial Genes; Traditional Villages; Village Protection.

1. Introduction

Amid rapid urbanization, rural construction often blindly pursues speed and modernization, leading to the widespread application of templated design methods and construction materials. This has severely impacted village morphology, resulting in the gradual loss of local cultural characteristics and the convergence of traditional villages with urban areas. With the elevation of "rural revitalization" to a national strategy, rural construction is poised to enter a higher-quality development phase, emphasizing the revitalization of rural culture and the continuation of rural characteristics through scientific planning. Identifying and extracting the spatial genes of traditional villages can reveal the interactive processes between the natural environment, historical culture, and village spaces, thereby uncovering the unique spatial characteristics of villages. This provides a localized planning and design approach for reshaping rural landscapes and inheriting rural ecological wisdom. This paper, using the Lübuyi Ancient Village in Binghua Village as a case study, analyzes the spatial characteristics of the village from the perspective of spatial genes and proposes methods and strategies for creating distinctive features.

2. The Concept and Connotation of Spatial Genes in Traditional Villages

2.1. The Concept of Spatial Genes in Traditional Villages

The concept of spatial genes was initially proposed for urban contexts. In biology, "genes" control biological traits by carrying genetic information, and the spatial evolution of cities is also dominated by certain specific patterns, which are concrete manifestations of urban cultural heritage. Academician Duan Jin introduced the concept of spatial genes, referring to unique and relatively stable spatial combination patterns formed through the interaction of urban spaces

with the natural environment and historical culture. These patterns are products of long-term interaction and evolution between urban spaces, the natural environment, and historical culture, carrying unique information from different regions and serving as identifiers of urban characteristics while maintaining a harmonious relationship among the three. The evolution of traditional village spaces is similarly closely linked to the natural environment and historical culture, making the concept of spatial genes applicable to traditional villages. Spatial genes are abstract extractions of the organizational relationships among existing spatial elements in traditional villages, which interact to form spaces at different levels. Consequently, spatial genes in traditional villages can be categorized into three types for extraction and analysis: layout genes, street genes, and courtyard genes.

2.2. Principles for Identifying and Extracting Spatial Genes in Traditional Villages

Not all existing morphological combination patterns in traditional villages qualify as "spatial genes." These patterns must be stable, locally representative, and widely recognized. Extracting and identifying spatial genes based on these principles is a crucial prerequisite for creating distinctive features in traditional villages.

2.2.1. Stable Spatial Combination Patterns

In the interaction between space, nature, and culture, various factors have specific evolution cycles, such as millennia-unchanged climate environments, century-unchanged patriarchal ethics, and dynamically evolving infrastructure. Under the influence of these factors, certain spatial combination patterns can retain their main characteristics and remain stable, forming the foundation of traditional village spatial morphology.

2.2.2. Locally Representative Spatial Combination Patterns

The extraction and identification of spatial genes require adherence to the principle of localization, which aligns with the objectives of protecting and creating distinctive features in traditional villages and is the most effective way to avoid homogenization. The natural and cultural factors interacting with space not only change over time but also exhibit significant geographical variations, leading to diverse village morphologies. For instance, the spatial morphology of mountain villages is generally considered more free and loose, while that of plain villages is more regular and clustered. Extracting locally representative spatial combination patterns can serve as a basis for strengthening the local characteristics of traditional villages.

2.2.3. Widely Recognized Spatial Combination Patterns

As the main inhabitants of villages, villagers' customs, beliefs, and other subjective factors influence village spatial morphology. Their deep understanding of the village means that their recognition of various spatial combination patterns indirectly reflects the extent of these influences. Extracting widely recognized spatial combination patterns can facilitate the effective transmission of local cultural information among different perceivers, preventing its distortion through generational changes and providing a guarantee for creating distinctive features in traditional villages.

3. Extraction of Spatial Genes in the Traditional Village of Lübuyi Ancient Village in Binghua Village

3.1. General Overview of Lübuyi Ancient Village in Binghua Village

Lübuyi Ancient Village is located in the northwestern part of Libo County. Binghua Village is predominantly inhabited by the Buyi ethnic group and is renowned for its distinctive ethnic characteristics. The Lübu group, affiliated with Jialiang Town's Binghua Village, is situated in

the central area of Binghua Village, approximately 33 kilometers from Libo County. The village enjoys convenient transportation and abundant resources. With a history spanning over 600 years, Lübuyi Ancient Village dates back to the Ming and Qing dynasties. Due to the abundance of local stones, which are extensively used for constructing terraces, roads, and houses, the village is also known as the "Stone Village." During the liberation of the southwestern region in 1950, the village was officially registered as Lübu Village by the local government. The village has preserved its traditional customs intact, and the Buyi ethnic Nuo opera has been documented in ancient texts known as Nuo books, which have been listed as national precious ancient documents. In 2014, Lübu Village was included in the list of traditional Chinese villages and the protection and development catalog of characteristic villages in the region. It has also been designated as a key village for rural tourism. In 2015, the village was planned as an integral part of the Huangjiang River Wetland Park.

3.2. Village Construction Genes

The village construction genes of Lübuyi Ancient Village are composed of its landscape pattern and village growth texture (Figure 1). The village is situated in a transitional Danxia hilly terrain, characterized by steep and rugged topography, making it difficult to find flat land for construction. Due to these geographical constraints, houses in the village are built along the mountainside, descending from higher to lower elevations. The village is nestled between mountains and rivers, with the winding Fangcun River flowing from north to south at the foot of the village, serving as an upstream tributary of the Daqikong and Xiaoqikong scenic areas. The terrain near the river is relatively flat, where water converges, and the soil is fertile. The river acts as a natural boundary, with villagers settling on both sides of the river and farmland distributed accordingly. Influenced by factors such as topography and sunlight, the residential layout exhibits a clustered pattern in the south and a scattered pattern in the north. The street planning is rational, with main roads divided into left, middle, and right sections, running straight up the terrain and connecting the entire village. Smaller pathways branch off from these main roads, providing access to individual households.



Figure 1: Aerial View of Zhelü Ancient Stockade

The residential architecture of each household (Figure 2) is constructed by stacking and layering stone blocks. The entire village is paved with stone slabs to form stone staircases (Figure 3), and the house foundations are built with stacked stones, following the natural contours of the mountainous terrain. The stilted houses in the village are exemplary representations of Buyi ethnic architecture. To mitigate the impact of natural factors such as river erosion and landslides, the buildings are constructed at a certain distance from the riverbanks and mountain slopes, resulting in a clustered spatial arrangement of the village.



Figure 2: Residential Buildings in Zhelü Ancient Stockade



Figure 3: Stone Paved Road in the Villag

The village exhibits a distinct geometric center, with characteristic structures such as the village gate, village square, dam, bridge, and plaza distributed in a regular pattern (Figure 4). Additionally, historical relics such as ancient trees, pagodas, and tombs have been preserved to this day. Several century-old residences and courtyards from the Ming and Qing dynasties, along with stilted houses, covered corridors, granaries, and ancient stone-paved alleys, are interwoven in a natural and harmonious manner, creating a serene and rustic atmosphere. The village structure is centered around the plaza, stilted houses, and ancient stone-paved alleys. The streets within the village are entirely paved with bluestone slabs, forming a crisscrossing network that connects every household.





Figure 4: The Stockade Gate, Dam, and Square Bridge of Zhelü Ancient Stockade in Binghua Village

3.3. Cultural Genes of Lübuyi Ancient Village

The cultural heritage of Lübuyi Ancient Village is imbued with strong local customs and ethnic characteristics, fully reflecting the unique cultural traditions and historical evolution of traditional villages in southern Guizhou. These cultural elements provide invaluable cultural support for the village, and their preservation, inheritance, and promotion are crucial for the sustainable development of traditional villages. The Buyi people of Lübuyi are a hardworking and intelligent ethnic group with their own language, vibrant traditional costumes, and distinctive residential architecture. Their marriage customs, festival culture, and other traditions have a long history, characterized by simplicity, antiquity, and mystique. According to investigations, traditional folk performances in Lübuyi Ancient Village include the Brush Dance, Bronze Drum Dance, Dragon and Lion Dance, Peacock Dance, Clam Shell Dance, and Dwarf Dance. Among these, the Brush Dance, Bronze Drum Dance, and Dwarf Dance are particularly emblematic of the ethnic culture, with the Dwarf Dance being recognized as a provincial-level intangible cultural heritage. Traditional musical instruments include the bronze drum, leather drum, suona, xiao (vertical flute), dizi (horizontal flute), erhu, pipa, sister xiao, and maoguan, with the sister xiao being the most distinctive. Traditional crafts include handmade cloth, cotton weaving, tie-dyeing, embroidery, and bamboo weaving. The Buyi people are known for their diligence and wisdom, with a rich cultural heritage that includes their language, colorful attire, unique residential architecture, marriage customs, and festival traditions, all of which are deeply rooted in history and exude a sense of simplicity and mystery. Key cultural activities include the "Buyi Small New Year Festival," "April 8th Bullfighting Festival," "June 6th Buyi Song Festival," "July Half Festival," "Full Moon Wine Celebration," and "Ritual Cleansing of the Village and Homes." Among these, the "Buyi Small New Year Festival" is the most significant, equivalent to the Han Chinese Spring Festival. During this festival, with strong support from the local government, Lübuyi Ancient Village hosts a series of activities such as ancestral worship, rice cake making, fishing, bullfighting, Buyi song duets, Buyi calligraphy competitions, and song and dance performances to protect and pass down ethnic culture.

3.4. Industrial Genes of Lübuyi Ancient Village

The industries in Lübuyi Ancient Village include agriculture, animal husbandry, handicrafts, and tourism. At present, migrant work is one of the primary sources of income for the villagers. The current economic structure is predominantly based on small-scale farming, with rice cultivation as the main crop and corn as a secondary crop, mostly grown in a single season. In mountainous and hilly areas, agroforestry is practiced, with mixed cultivation of corn, fruits, peppers, and vegetables. In low-lying farmland, indica rice and glutinous rice are interplanted, with glutinous rice typically surrounding the indica rice. During the rainy summer season, the construction of the Lübu Reservoir helps mitigate flood damage to the paddy fields along the

riverbanks. In the event of drought, the reservoir's ample water supply, combined with manual or mechanical water extraction, ensures adequate irrigation for crops. In winter, the village rarely experiences snow or frost, allowing for uninterrupted cultivation of winter crops such as rapeseed. Thanks to the natural ecological environment, agriculture, forestry, animal husbandry, and fishing provide both livelihood resources and economic income for the village. Lübuyi Ancient Village boasts superior natural and cultural landscapes, with distinctive residential architecture, rich ethnic culture, beautiful living environments, and harmonious ethnic relations. The villagers are highly motivated in rural development, and the village has a solid foundation for community projects. The combination of long-standing cultural heritage and naturally beautiful landscapes makes Lübuyi Ancient Village highly valuable for tourism development. With the preservation of traditional village features and the promotion by cultural and tourism authorities, the village has generated some income through tourism. However, most young villagers still rely on migrant work as their primary source of income.

4. Challenges in the Inheritance of Spatial Genes in Lübuyi Ancient Village

4.1. Inadequate Protection of Texture Genes

With the development of new rural construction and the growth of traditional village tourism, Lübuyi Ancient Village, although not undergoing large-scale development, has attracted a number of tourists due to media and internet promotion. As the village now serves dual functions of tourism and daily life, the originally tranquil and peaceful lifestyle of the villagers has been affected to varying degrees. This process has led to the potential disruption of texture genes. For instance, the stone-paved ancient paths in the village exhibit issues such as missing or worn stones, resulting in discontinuous street textures. Some stones have become smooth or overgrown with moss due to frequent foot traffic or exposure to damp and water-eroded areas, posing safety risks such as slipping. Additionally, the foundations of some buildings along the ancient paths are heavily covered with moss, significantly detracting from the village's aesthetic appeal. Furthermore, the village faces challenges such as underutilized public spaces and low-quality public services. Field investigations reveal that while the central square is frequently used, the duration of stays is short. As a crucial node in the village structure and an important carrier of villagers' nostalgia, the central square's potential remains underutilized. The village's public service centers also suffer from low quality and insufficient facilities.

4.2. Poor Integration of Cultural and Industrial Genes

As a traditional village, Lübuyi Ancient Village follows a typical rural development model that prioritizes agriculture over services. The village lacks cultural spaces and service facilities catering to outside tourists. Although the cultural genes are rich and profound, there is a lack of external awareness of its deep cultural heritage. Currently, the village lacks physical spaces for cultural education, and its cultural attractions are scattered, making it difficult to form a coherent cultural narrative. Moreover, cultural promotion is limited, relying primarily on a single public WeChat account, which dedicates minimal space to promoting Lübuyi Ancient Village and has low click-through rates. The current inward-focused, low-end business model and inefficient use of cultural spaces have resulted in insufficient industrial vitality and low cultural appeal. This not only hinders the effective utilization of cultural resources but also limits the potential cultural dividends.

5. Strategies for Protecting Spatial Genes in Lübuyi Ancient Village

Similar to the principles of genetic inheritance in biology, spatial genes are encoded by spatial elements according to specific rules, carrying information about stable spatial combination patterns. These genes control the structure of spatial element combinations through direct

pathways, thereby influencing the morphology (traits) of cities or villages, often through multi-gene control mechanisms. In Lübuyi Ancient Village, the village construction genes, cultural genes, and industrial genes collectively govern the organization and evolution of spatial elements, shaping the village's distinctive characteristics. To propose strategies for the preservation and enhancement of Lübuyi Ancient Village from the perspective of spatial gene inheritance, it is essential not only to protect existing spatial elements but also to maintain the underlying organizational principles.

5.1. Continuation of the Natural Landscape

The favorable mountainous and aquatic topography of Lübuyi Ancient Village serves as a natural barrier, determining the spatial growth direction of the village. Together with the lush vegetation, it shapes the village's environmental characteristics and indirectly mitigates the erosion of traditional village features by modern development. Therefore, protecting the natural landscape is fundamental to preserving the unique identity of Lübuyi Ancient Village. The village's development should adhere to its traditional Feng Shui layout, with the northern and southern mountains and the Fangcun River as boundaries. Emphasizing the visibility of mountains and water should be a focal point in creating distinctive spaces, allowing people to appreciate the natural scenery. The river flowing through the village acts as its central axis, influencing the spatial layout. The ancient trees, green stones, and moss along the riverbanks bear witness to the harmonious coexistence of humans and nature, while the riverside houses collectively create the idyllic imagery of a "small bridge, flowing water, and homes." Thus, restoring the river's ecological environment and positioning the Fangcun River as the core landscape of the ancient village is essential.

5.2. Protection of Streets, Alleys, and Courtyards

Street and alley spaces carry the daily activities of residents and serve as the most direct medium for people to perceive the regional characteristics of Lübuyi Ancient Village. The protection of these spaces should maintain the original names and directions of the streets and alleys, preserving the tree-like street pattern formed by the two main streets along the river and the alleys built along the slopes. Efforts should be made to retain historical elements such as ancient trees and pagodas, continuing their spatial combinations. Preserving the spatial organization of courtyards while adapting them to future functional needs is crucial for showcasing the village's cultural heritage. Courtyards along the streets should maintain their integrity, with architectural styles consistent with the village's rustic image. Incorporating leisure installations and landscape features into the existing elements can create spaces for public interaction. For the village's public spaces, the original textures should be preserved, and the landscape environment should be restored to maintain the tranquil and harmonious spatial characteristics. Functional revitalization can be achieved through cultural exhibitions and accommodation experiences.

5.3. Recreating Scenic Memories

Merely restoring the physical spaces of Lübuyi Ancient Village is insufficient to comprehensively convey its cultural essence. Therefore, recreating past scenic memories through immersive experiences is vital to enhancing people's perception of the village's unique characteristics. For instance, organizing cultural exchange activities, establishing art creation bases, and inviting scholars and artists to reside in the village can enrich its cultural atmosphere. Activities such as ritual ceremonies, folk craft experiences, and ancient village tourism festivals can boost popularity and stimulate commercial development. Simultaneously, creating a series of ancient scenic spots can help recreate the profound cultural heritage of the village.

6. Conclusion

This study, based on the perspective of spatial genes, explores the genetic map of the traditional village of Lübuyi. Guided by spatial genes and adhering to the principles of preservation and inheritance, it proposes spatial strategies rooted in village construction, cultural heritage, and industrial development to optimize the protection, renewal, and utilization of traditional villages. However, the renewal and protection of traditional villages should not be limited to physical spaces but should also encompass social structures and collaborative governance by villagers, collectively promoting the renewal and revitalization of traditional villages.

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