

Design Strategies for Rural Revitalization under the Background of Rural Revitalization: A Case Study of Baimaozhuang Village, Baodi District, Tianjin City

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Abstract Through the practical design of Baimaozhuang Village in Baodi District of Tianjin City, this paper analyzes the historical, social, and cultural background of the village, sorts out the current construction situation, rural style, and public space usage, and elaborates on the revitalization strategy from the perspectives of planning and architectural design. From the perspective of planning and design, it is mainly reflected in road network optimization, landscape improvement, and node implantation. From the perspective of architectural design, it is mainly reflected in building renewal, space revitalization, and style enhancement, with the expectation of building a charming rural area with regional cultural characteristics.

Keywords Rural revitalization, Planning and design, Building renewal, Baimaozhuang Village

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With the proposal of the national rural revitalization strategy, rural planning and construction are the forefront issues and practical hotspots in current urban construction. The function of rural areas is not only to provide production services, but also as a place of life. In the future, rural revitalization and cities cannot be separated, and the function of rural areas will be reshaped, not only as service points for agriculture, but also as an organic part of cities^[1]. Rural architecture, as an important carrier of rural development, has increasingly highlighted the issues of its construction and rural development. Therefore, rural construction requires us to leverage professional advantages, with the aim of adapting to industrial development. Innovative conceptual design schemes for rural revitalization are proposed, thereby promoting sustainable development of rural revitalization.

1 Project background

1.1 Current situation of Baimaozhuang Village

Baimaozhuang Village is located in the southwest of Lintingkou Town, Baodi District, Tianjin, adjacent to the Chaobai New River to the west. It has convenient transportation and a superior geographical location. At the same time, Baimaozhuang Village is also the hometown of Feng Kangyuan, a Hanlin of the Ming Dynasty, with a profound historical and cultural heritage. It is one of the ten ecological tourism villages approved by the municipal government in Tianjin in 2014. The buildings in the village are in the form of quadrangle courtyards, and various

cultures in the village such as historical culture, Hanlin culture, and folk culture blend together, which has the potential to develop tourism, homestays, and agritainment.

1.2 Existing issues

The current problems in the village mainly include uneven building quality, inactive public spaces, lack of landscape design, chaotic road and water system planning, and severe hollowing out. Therefore, how to retain talents and activate the architectural style of villages have become issues that need to be addressed for future development. This paper proposes feasible strategies from the perspectives of planning and architecture.

2 Design strategy

2.1 Planning level

Based on the research summary, under the dual background of problem and demand oriented, a planning strategy of “weaving the lotus in the water and creating new homes with joy” is proposed. It hopes to achieve the beautiful vision of “creating new homes with joy” through architectural renewal and renovation design, landscape creation, ecological improvement, and joint industrial upgrading.

Based on the original site characteristics of Baimaozhuang Village, the planning scheme sorts out the road network and water system, divides functional areas, and forms a network pattern with clear priorities. The village is intertwined with ponds and rivers, streets and courtyards, and fields and forests, forming a spatial order rich in rural characteristics, thereby creating rich rural intentions and continuing the

common rural memory of the villagers.

2.2 Building level

The integration of rural tourism and cultural industry injects new vitality into modern rural architectural design, which helps to achieve the goal of rural revitalization strategy^[2]. At the architectural level, by combing the architectural space under the guidance of industrial strategies, it develops the primary industry led by grapes, rice and lotus root. Meanwhile, it encourages college students to return to their hometown to start businesses, uses Internet technology to implement a new large-scale and mechanized production mode, develops grape picking, water garden sightseeing and other experience activities, and builds home stay, cultural and creative blocks and other related supporting buildings, thereby building a beautiful village that is ecologically livable and suitable for tourism.

3 Practice plans

3.1 Planning and design within the village

3.1.1 Landscape. In terms of ecology, based on water system greening, the point axis is extended, and water is diverted into the scenery. At the same time, surrounding buildings and public spaces are integrated to form a leisure area with regional characteristics. The water network system formed by the water surface and ditches in the entire village area is also a public space guided by walking.

3.1.2 Space. In terms of space, in order to improve the singularity of the original street and alley space, idle houses are demolished, and spatial nodes are implanted. At the same time,

slow-moving trails are added near important nodes. Combined with road space, buildings and landscapes are distributed in a point like and belt like manner, forming a village spatial pattern of one center, three axes and multiple areas (Fig.1).

3.2 Architectural design within the village

On the basis of the rural revitalization strategy, research on village revitalization is conducted around the functions of village buildings, open spaces, and layout of building groups. It should establish a complete spatial logic with the goal of revitalizing villages; provide detailed design plans for the construction and renovation of buildings in the village; propose requirements for the protection and control of architectural features and styles; complete the detailed spatial design of important nodes. There are three types of project buildings, namely new construction, building renovation, and functional replacement construction (Fig.2).

3.2.1 Architectural style control. The improvement of regional recognition of rural architectural space cannot be achieved without the integration of elements with local characteristics, which is also an effective method to avoid homogenization in the design of rural architectural space renovation^[3]. Therefore, in terms of architectural style control, comprehensive consideration should be given to the appearance, materials, and colors of the original building. By extracting architectural element symbols with local characteristics (Fig.3) and organically combining them with new architectural forms, the building volume, style, and color should be

integrated with the surrounding environment while forming its own characteristics.

3.2.2 New buildings. The function of newly constructed buildings is to enhance the existing functions of the village, making it an activation point for the village's public space. How to improve the existing appearance of rural areas and protect rural architectural styles with different cultural characteristics is also a focus worth paying attention to in the process of modern rural architectural design^[4].

The newly constructed buildings all use the technique of sloping roofs, which are in line with the existing buildings in the village in form. In terms of building materials, the roof is mainly made of gray tiles, and the facade and structure use the building elements of wooden frames and red brick. By connecting old and new building materials, preserving some historical memories, integrating the regional culture of the village with the spirit of modern architecture, it fully expresses respect and inheritance for the rural style, endowing the building with narrative power, and making it a meaningful carrier.

(1) Cultural and creative block cluster. By innovating traditional architectural elements^[5], the cultural and creative block divides the courtyard walls, courtyards, and wing rooms, and constructs new building clusters from multiple separated courtyards and walls. Then, through the implantation of landscapes, the inner streets, squares, courtyards, alleys, and other spaces are connected to form a spatial sequence of the block. Buildings such as slice walls and wooden frames are designed to interpenetrate the block

with the landscape, allowing people to feel the gradual spatial hierarchy as they walk through the block.

There are three groups of buildings in the cultural and creative block, which combine functions such as the rural creative youth office area, dining area, and cultural and creative experience. Each group of buildings forms a complete streamlined organization, and the concept of blocks is introduced into the site to coordinate the complex functions and pedestrian flow of the site.

(2) Village activity center. There is a plot of peach trees in the village activity center base, with residential buildings on the north side and the main entrance located on the west side, adjacent to the exit of the cultural and creative block. To create a continuous landscape axis, some peach trees are preserved to form a courtyard, while the building blocks are broken down to coordinate the relationship with residential buildings in a small volume and reduce visual pressure on the northern plot.

The flat functions of the village activity center include elderly activity rooms, chess and card rooms, and health rooms. The “工” - shaped flat is used for dynamic and static zoning, which can effectively avoid the intersection of flow lines and form a landscape axis. The space is rich, and experiential value is strong.

(3) Agricultural experience processing workshop. The south side of the agricultural experience processing workshop base is the planting experience area. The entire building opens in a “U” font towards the south landscape, forming an inner courtyard. The courtyard is divided by square elements, conforming to the square texture of the planting experience area on the south side, and forming a landscape sequence from the inside to the outside. The water courtyard set inside the building's courtyard can collect rainwater and convert it into a natural irrigation system for green plants such as vegetable gardens, promoting ecological balance and nature conservation^[6].

3.2.3 Renovation of buildings.

(1) Concept of transforming architectural. Rural architecture is the main element that constitutes the distinctive rural style^[7], and it is the spatial composition of rural life. Therefore, the transformation of rural architecture should be based on respecting the current situation, strengthen the connection between the preservation and development of residential architectural culture, and explore its economic and cultural vitality as much as possible. Modern architectural concepts and techniques should

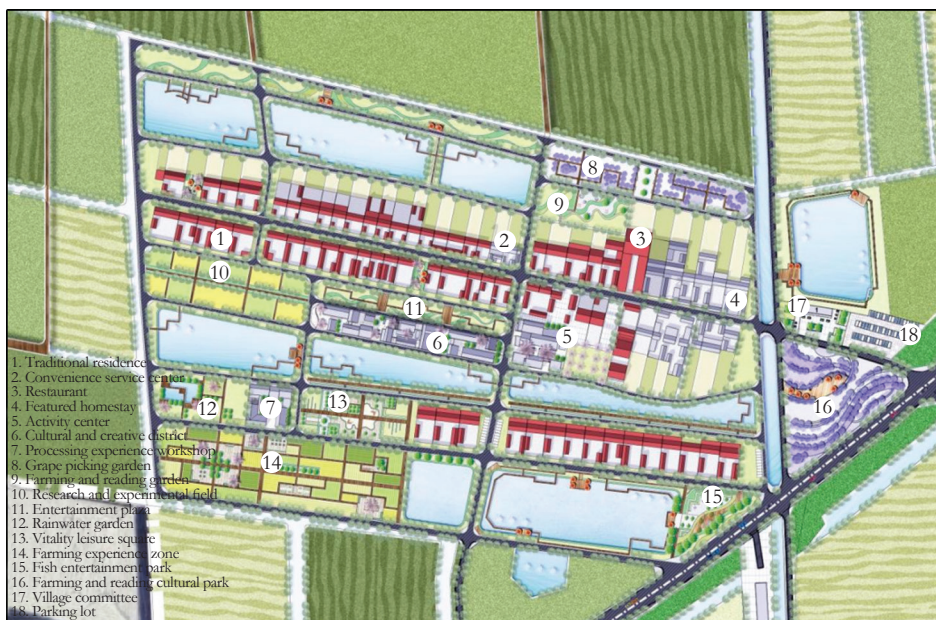


Fig.1 Spatial pattern of village

be used for innovative transformation, thereby promoting the economic, cultural, and economic revitalization of rural areas^[8].

To preserve the authenticity of the building, by integrating original architectural texture, architectural renovation organically combines new functions with the old buildings. At the same time, it is necessary to effectively protect the main structure of the original building and pay attention to the combination of new and old

building materials.

(2) Homestay renovation. The renovation of the homestay is designed based on the original traditional three-bay building, with the main room designed as a public living room and the wing rooms designed as homestays. The newly built wing rooms have flat roofs, making the traditional building more in line with modern aesthetic concepts^[9]. At the same time, a roof platform is set up to provide tourists with

abundant outdoor space. In order to ensure good ventilation, the guest rooms are equipped with independent landscape courtyards, providing a good living environment.

3.2.4 Functional replacement. The design of the convenience service center is based on the original convenience store. Combined with idle houses, it is designed through functional replacement. Enhancing the public use function of existing idle houses can effectively improve their utilization rate^[10]. The original convenience store is located at the intersection of transportation arteries, using the principal room as a convenience store. Now, the convenience store is placed in the western-wing house for easy external sales, and the privacy of the courtyard could be improved. Wing rooms are added to the existing idle space, and the east and west wing rooms are combined through corridor design, positioning them as breakfast shops, self-service banks, etc.

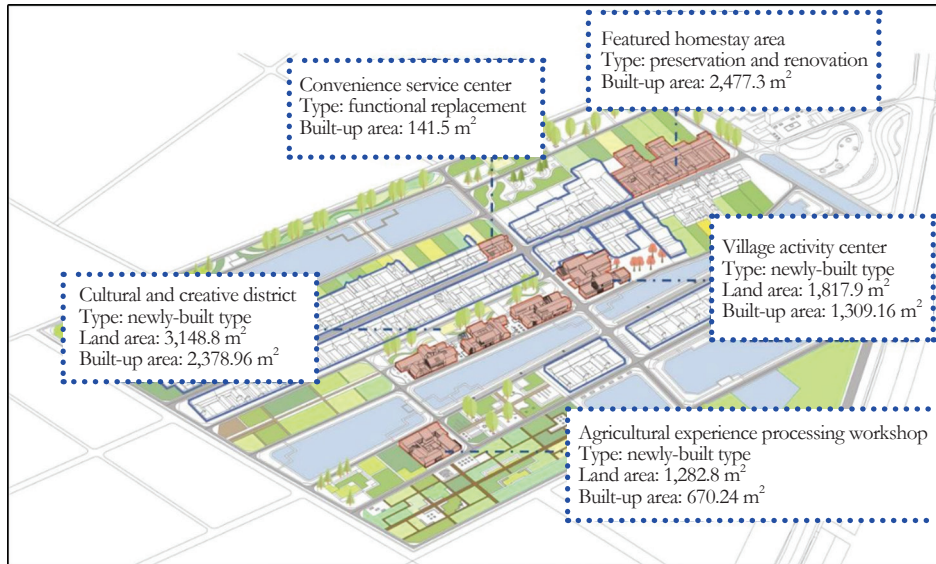


Fig.2 Project building type

4 Conclusions

The implementation of the rural revitalization strategy will bring about a brand new change in the appearance of rural areas. However, the design of rural renewal is not static, nor is it blindly demolished, rebuilt, or developed. Instead, it is necessary to adapt to local conditions, comprehensively consider the

Extraction of traditional architectural elements



Slope roof

Wooden beam frame

Roof tile hanging

Extraction of local architectural materials



Tile

Tile

Reed matting

Extraction of original building color



Fig.3 Extraction of architectural element symbols

(To be continued in P50)

advantage of rapid connectivity and efficient services, which affords them a competitive advantage in the regional market. In light of these considerations, it is possible to view these entities as “service providers” whose role is to facilitate the continued development of modern service industries, optimize the functional layout of the city, and enhance the speed and quality of the city’s external links. The remaining cities have the opportunity to enhance their connections with other cities within the network, thereby boosting their energy levels.

The analysis of social networks based on LBS data from Baidu migration offers a novel perspective for the study of urban area structure. The present study employs a single day’s data, which can be synthesized with data from multiple days to examine the spatio-temporal evolution of urban spatial structure. This approach can provide valuable insights that inform the study of urban spatial structure.

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needs of rural development, analyze specific problems, prescribe targeted solutions, and avoid the phenomenon of one village for every village. Modern rural construction should fully tap into the regional and cultural characteristics of rural areas. While respecting and inheriting traditional architectural features, it should meet usage needs, introduce modern architectural design concepts and new technologies, and achieve the localization, practicality, comfort, and sustainable development of rural architecture.

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