

Research on Rural Architecture Regeneration from the Perspective of the Integration of "Old and New" Taking Xiejiafangshen Village in Anshan City as an Example

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ABSTRACT

Given the issues encountered in the process of regeneration of rural architecture, "old and new" symbiosis idea was proposed in the paper as a regeneration design. The application of such idea in real life was elaborated from the perspectives of spatial reorganization, functional replacement, material perception and emotional resonance. Specific practical projects are also illustrated as examples to reveal the symbiosis of old and new in the regeneration design of existing rural architecture.

Keywords: "Old and new" symbiosis idea, Rural architecture, Regeneration design, Xiejiafangshen Village.

1. INTRODUCTION

Driven by progress in rural economy and the transformation and upgrading of related industries, the income of farmers has been increased significantly, which has spawned a boom in the construction of rural residence. Most rural architecture that fail to satisfy farmers' needs in production and living have been demolished and rebuilt, which results in both similar styles and environmental pressure, running counter to the strategic goal of sustainable development in China. This paper studies the regeneration design of rural architecture, and explores the methods to revitalize the rural architecture in the context of new environment and new demand, which is in urgent need.

2. OVERVIEW

2.1 Current Situation of Rural Architecture Regeneration

"Regeneration design" refers to a design method that recycles the space or structure that has lost part of its use function in rural architecture using modern scientific and technological means and theoretical research results. The various existing problems and regional differences of buildings

require targeted regeneration content and methods. Functional regeneration and preservation of regional features must be taken into account. Farmers serve as the main body of practice in the regeneration design of rural residence in China, thus fully reflecting design autonomy. However, they mostly rely on experience accumulated in housing construction, and lack the support of professional knowledge and advanced technology, which leads to blindness and spontaneity in regeneration design. For example, the relatively single regeneration mode: imitation among villagers leads to similar and stereotyped design; excessive emphasis on urban style elements over regional characteristics and atmosphere; unfavorable regeneration quality and ubiquitous illegal buildings; and irrationality on function replacement and space layout[1]. In short, a favorable regeneration design of rural architecture should not be the one dominated by one party, but a comprehensive design that takes into account human needs, regional culture, residential functions, etc.

2.2 *Symbiosis of "Old and New" of Regeneration Design of Rural Architecture*

The differences of rural architecture in time of completion, construction technology, and materials lead to the uneven conservation status. According to research, rural architecture that can be regenerated fall into two camps [2]: the first is the transformation type, which is relatively intact, and low-cost regeneration can be realized by repairing and replacing the damaged parts; and the second is the reconstruction type, which is severely damaged and cannot be repaired. Such house can only be dismantled and rebuilt on the original homestead. Both have to deal with the collision between the old and the new. The transformation type should consider the function and characteristics of the original building, and deal with the connection and transition between the new part and the old building, while the reconstruction type needs to consider the coordination between the new building and the surrounding environment, and employ emotional language to construct people's perception and memory, and place spirit of the original architecture [3]. As a result, they are required to redesign new techniques, materials and technologies while fully understand the connotation and essence of the rural architecture, so as to promote the integration of "old and new", as well as the regeneration of rural architecture.

2.3 *Value Analysis on Symbiosis of "Old and New" of Regeneration Design of Existing Rural Residence*

Investigation reveals that the existing rural architecture cannot meet farmers' needs well, and the practice of demolition and construction runs counter to the strategy of sustainable development in China, which proves regeneration design's dominant position in the preservation and revitalization of existing rural architecture. Economically, the regeneration design of rural architecture can reduce the cost of manpower, material and financial resources needed for demolition and construction. The transformation of part of the function of the rural architecture and the combination of the characteristics of new materials endows a second life to the residence. Culturally, the exchange and mutual accommodation of new cultural elements and existing cultural elements helps to preserve local features and enhance people's place memory and sense of cultural identity. The regeneration design can avoid

pollution of the ecological environment caused by industrial waste produced during demolition and reconstruction as for ecology. In addition, the use of green materials and energy can promote the sustainable development of rural architecture.

3. REGENERATION DESIGN METHOD BASED ON "OLD AND NEW" SYMBIOSIS IDEA

3.1 *Spatial Reorganization*

Farmers' only relied on rural architecture for basic living needs previously due to the constraints of financial resources, material resources and energy. The survey revealed a large number of issues facing existing rural residence such as uneven distribution of bedroom space and public activity space and poor utilization of space. Such issues can be addressed through the re-planning and combination of existing space, such as horizontal spatial reorganization and vertical spatial reorganization [4]. In terms of horizontal space reorganization, the space needs to be re divided and combined according to the requirements of people's door and scale. The space is re-divided and combined according to people's needs and scale requirements. For large space, more new walls and columns, the removal of old partitions, and the addition of flexible new partitions can be applied. As for smaller space, the practice of removing old and non-load-bearing partitions or adding holes in the walls can be employed to merge the smaller space into larger and usable space. As for the external space, more space can be added horizontally to the outside of the building, serving as functional space needed for the interior. Vertical spatial reorganization refers to adding new floor partition and loft to enlarge space, or removing part of the old floor to increase the height of the functional area of the interior space.

3.2 *Functional Replacement*

With the development of the times, the way of production and life of farmers has developed from agricultural production to diversification, such as tourism and handicraft industry. The development of rural architecture is advancing towards the direction of "integration of industry and residence", which requires more flexibility in the reconstruction of existing rural architecture to satisfy various service objects and corresponding service functions. For example, the new industry of "home stay" has brought new possibilities to the

regeneration design of existing rural architecture in some villages with distinct regional characteristics that are committed to the development of rural tourism. On the basis of meeting the living needs of farmers, such rural architecture should be designed according to the characteristics of home stay, taking into account the coordination between the old elements and the new elements [5].

3.3 Material Perception

In terms of the regeneration design of existing rural architecture, the selection of old materials and new materials is particularly important. Such collision between the old and the new can lead to more unknown possibilities. The old materials preserved can not only be used as decoration, but also arouse the emotional resonance of people with the same cultural background, giving people a multi-dimensional experience combining vision, smell and touch. Meanwhile, historical memory and time elements can be added to the space, thus increasing the sense of hierarchy of the space. The use of new materials, in addition to aesthetic considerations, is more of a complementary role, protecting the damaged parts or strengthening the structure of the space [6]. The integration of old and new materials makes the whole space more interesting and thought-provoking.

3.4 Emotional Resonance

Rural residence inherit the precious memories and emotions of several generations, so the regeneration design must emphasize emotional language to shape the space. In the design process, the space needs to be fully summarized to distinguish people's needs for new space and their dependence of old space. On this basis, the new and old elements are integrated and innovated. Such a space bears emotion, and experiencers can feel the fluctuation of emotion in it, which is the embodiment of humanized design [7]. When introducing the industry of home stay, for example, its special features should be highlighted: the symbol of a kind of special emotion and attitude to life. As a result, the design needs to start from the perspective of emotional needs, using the material, color, function and other elements in the space or the way of imagination, association to promote emotional resonance [8].

4. DESIGN AND PRACTICE OF RURAL ARCHITECTURE OF XIEJIAFANGSHEN VILLAGE IN ANSHAN CITY

4.1 Project Overview and Design Ideas

4.1.1 Project Overview

Xiejiafangshen Village is located in Dagushan Street, Tiedong District, Anshan City, Liaoning Province, which is an urban-rural fringe area. It is surrounded by favorable supporting facilities, convenient transportation links and sound geographical location. Located in the warm temperate continental monsoon climate zone, the local enjoys suitable temperature, abundant precipitation, and less severe weather, which is suitable for living and leisure.

Tiedong District is famous as the hometown of storytelling and the cradle of world champions. It has cultivated many famous people, such as Shan Tianfang, a Quyi master, Liu Lanfang, etc. Tiedong district is rich in natural resources, such as Qianshan Mountains, 219 Park and so on. In recent years, relying on its rich natural and cultural resources, Tiedong District has implemented the "tourism +" development strategy according to the layout of "one core, two seasons and four routes" to promote the integrated development of tourism industry and other industries. In addition, it has created a number of well-known agricultural special industries in the province and in China, represented by Nanguo pear.

The buildings in Xiejiafangshen Village are mainly made of brick and concrete. The sloping roof, red brick walls and towering chimneys have become the unique symbol of the village. The building tone is mainly gray and reddish brown. ("Figure 1")

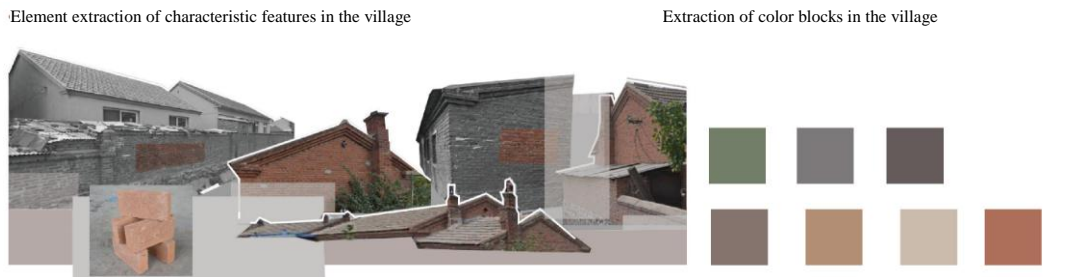


Figure 1 Feature element extraction of the project site.

In this paper, the rural architecture to be designed for regeneration is a courtyard with an area of about 1000 square meters, of which the building covers an area of about 250 square meters. As a one-story flat-roofed building from the 1990s, it consists of a north-south main house that meets the owner's basic living needs, four east-west rooms for recreation, temporary rest and storage of groceries, and the remaining space in the front yard

consisting mainly of a grape pergola and two fruit trees. The main building is tiled, with a closed, 1500mm wide sunlight room on the north side, and the rest of the building facade is whitewashed. The backyard is mainly planted with fruit trees and vegetables, among which there are four fruit trees in good growth. The rest is occupied by a lot of vacant lot. ("Figure 2")



Figure 2 Site situation.

4.1.2 Design Ideas

The authors summed up several key points of the regeneration design after understanding the demands of the owner. The first part is the renovation: renovation of the building facade, replacement of damaged parts, optimization of internal space and function, and rearrangement of courtyard space. The second is addition: one more sunlight room, the introduction of home stay, planting economic vegetation (vegetables, fruits), regional characteristics. Finally, preservation: two fruit trees in the front yard and four trees in the backyard, and the original structure of the building should be preserved. Therefore, following the "old and new" symbiosis idea, this practice designs the rural architecture in different regions and types. In terms of objects, regeneration is mainly carried out from the aspects of overall design, architectural design, interior design and courtyard design. As for methods, "new" is mainly reflected in new industry, new ideas, new functions, new technologies and new materials, while "old" in the original structure, the preservation of trees, local characteristics, emotional reproduction. ("Figure 3")

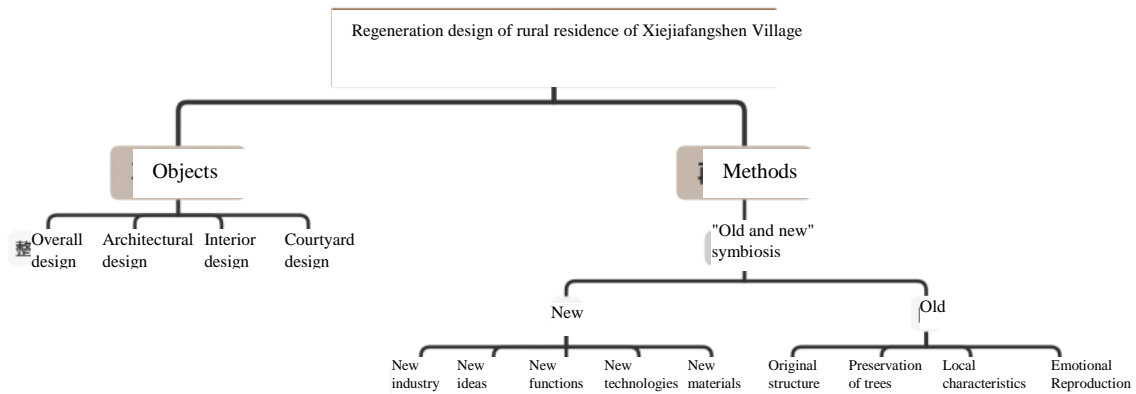


Figure 3 Design ideas map.

4.2 Rural Residence Space

In this project, the original building and the rectangular empty courtyard are transformed in two ways. The first is to add structures — sunlight room and gallery frame; the second is to embed the leisure platform that defines spatial dimensions to divide the courtyard into "third-level courtyards", thus enriching the spatial level ("Figure 4"). The first is to set up a leisure platform. Considering the

regional characteristics of relatively cold winter, a buffer platform of a certain width should be set outside the building to mitigate the influence of winter wind on indoor temperature. At the same time, the construction of public space is very important in the design of home stay. The leisure platform provides more space for outdoor activities and more opportunities to interact with the courtyard landscape. ("Figure 5")

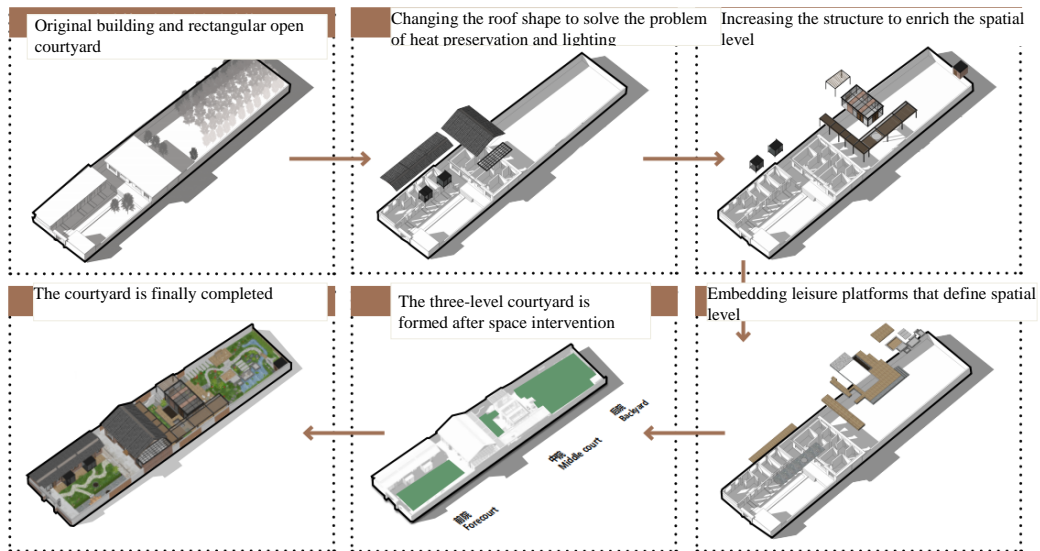


Figure 4 Schematic deduction diagram.



Figure 5 Renderings of leisure platform (from left to right: front yard, back yard).

The sunlight room in the north is designed to make full use of the vacant lot in the backyard, providing a warm indoor activity space in winter. The sunlight room is close to the main room, and the two form a continuous space in function, so the hollow wood grille and hollow glass corridor are employed to connect the two buildings, forming a virtual space between the two, which can alleviate the contradiction between the old and new

buildings ("Figure 6"). The use of natural elements can bring more temperature to the integration of the old and new in the space. Therefore, the four fruit trees and connecting corridor required to be preserved in the original site can not only reconcile the contradictions between the old and new space, but also create a benign interaction between natural elements, people and architecture.



Figure 6 Renderings of atrium (corridor and sunlight room).

In this case, the relationship between the old and the new continuously appears in the same space, and the courtyard, as the medium of the fusion of the old and the new, is endowed with new connotations ("Figure 7"). A series of open and

semi-open space are adopted to form a number of co-existing space, which promote the harmonious coexistence of old and new architecture, architecture and environment.



Figure 7 Renderings of courtyard (front yard, back yard).

4.3 Functions of Rural Residence

In order to maintain the integrity of the courtyard, the storage room on the right side of the entrance was removed and moved to the right side of the backyard. In order to meet the requirements of home stay industry, the four rooms on the left are rearranged and the walls are adjusted to form a

spatial layout of two guest rooms and one tea room. Besides, landscape boxes are designed outside the walls of the two guest rooms to provide more space for guests to interact with the front yard ("Figure 8").



Figure 8 Renderings of secondary buildings.

Considering local climate characteristics, the internal space layout of the residence not only meets the functional requirements of home stay, but also utilizes the principle of auxiliary space buffer [9]. First of all, the entry door in the original south is moved inward by 1500mm, and a built-in windshield door bucket is set. In addition, a west exit for winter use is added, and a built-in windshield door bucket is also set. Once the original entrance is opened, you can see the toilet door opposite its front. According to fengshui theory (geomancy), the wall of the original left room is partially dismantled and the toilet door is moved to the left. Considering that this room offers the best view of the fruit trees in the middle

courtyard, the room is used as a transition space between the bathroom on the right and the room on the left. In addition, the auxiliary space is arranged on the side dominated by winter wind, such as toilet, kitchen, storage room, etc., and the main function room is arranged on the south side to maximize the illumination, such as the master room, living room, dining room, etc. In order to solve the problem of insufficient light due to excessive depth, part of the wall on the left side was transformed to create a connecting corridor between the west side door and the south front, and a skylight was installed to bring the maximum light into the interior space. ("Figure 9")

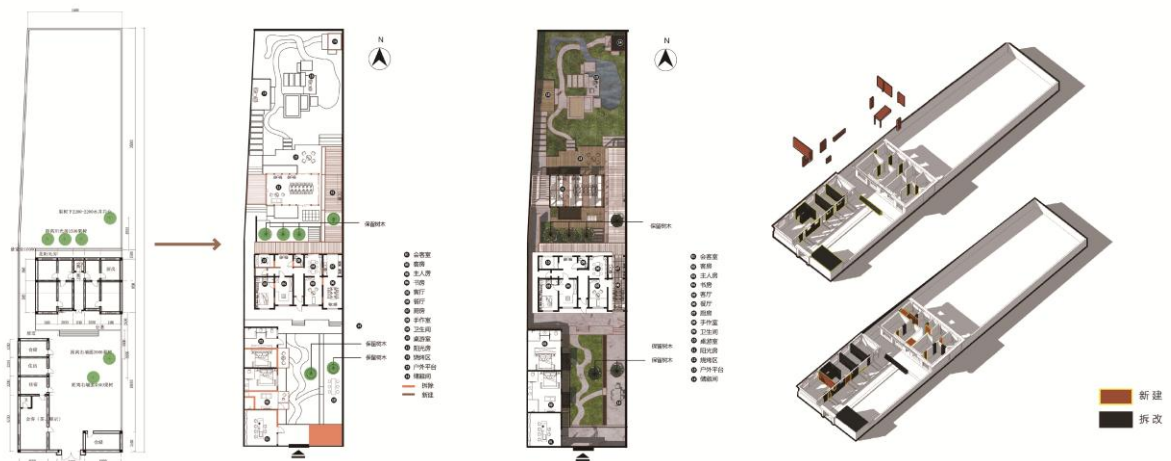


Figure 9 Building demolition plan and floor plan.

The courtyard space after the regeneration design is mainly divided into three parts: front yard, middle yard and backyard. The front yard is designed to accommodate guests and interact with each other, such as a tea room, two guest rooms and an outdoor dining table. The middle courtyard satisfies the host's daily life and provides interaction space, such as: living room, dining room, study, handmade room, entertainment room, etc. Backyard is more to provide guests with an

interactive experience with nature, such as: sand pit, pond, swing, fruit tree picking, etc. Streamline is organized from the perspective of humanization and regionalism. With guests as the main body of the traffic streamline, tour routes and public activity routes are set up. According to the local climate characteristics, winter activity routes are set up to alleviate the impact of weather on people's life and experience. ("Figure 10")

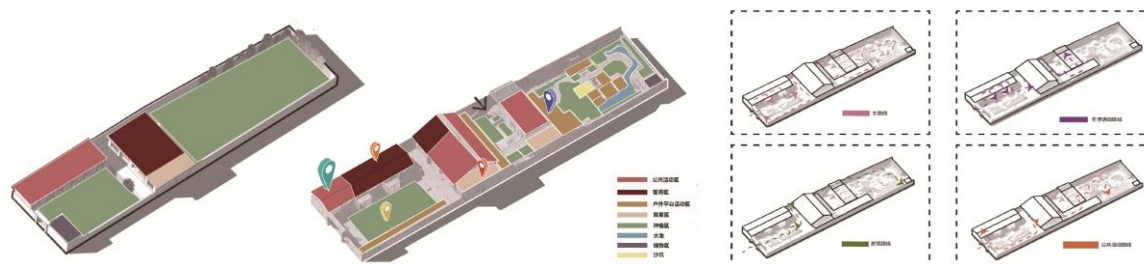


Figure 10 Functional analysis diagram and flow diagram (from left to right).

4.4 Style of Rural Residence

Without affecting the use of the building, the local characteristic element -- red brick was extracted. The building facade was updated and the flat roof was changed into a slope roof consistent with the local landscape. Columns and mill beam of steel structure were used as the foundation for the construction of the slope roof, and the shingles compatible with other local dwellings were selected

as the material. A "viewing box" is added to the two guest rooms on the left of the front yard to provide guests with more space to interact with the front yard. Taking into account the characteristics of the local house: large south window and small north window, the scale of the south window was retained, and the material was replaced with aluminum windows and insulating glass [10]. ("Figure 11")

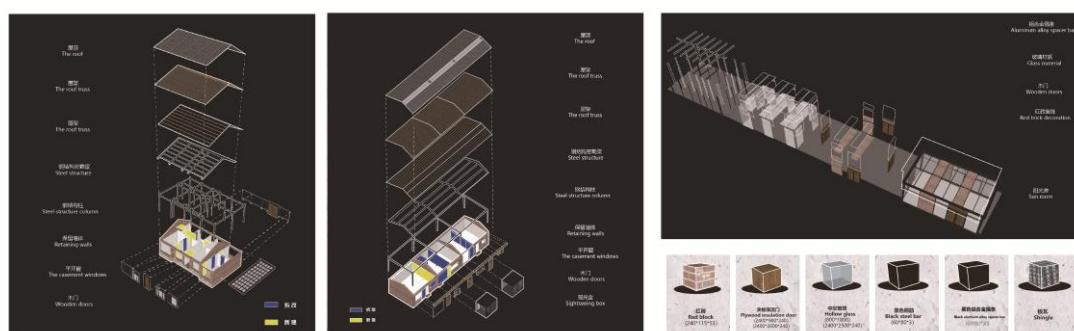


Figure 11 Structural (from left to right: secondary building, main building, sunlight room).

For the interior, the concrete floor is used, and the decorative parts are made of bamboo cane, wood and red brick, which can convey memories. For example, a light belt is set inside a dustpan woven of bamboo rattan, which can not only be used as a barrier to separate the space, but also for lighting. It contrasts with the stacked objects of red brick, which enriches the layering of the space and creates a simple, heavy texture. ("Figure 12")



Figure 12 Renderings of the interior (from left to right: tea room, guest room, sunlight room).

Economical local plants such as Nanguo pear, apples and hazelnuts are planted in the courtyard. The paving materials are mainly brick and slate with local flavor, and the remaining materials after demolition are effectively utilized. For example, earth, brick and stone are employed for

maintenance partition, and old wood is used for swing, seat and interior decoration. ("Figure 13") Such combination of new materials and local materials ensures safety, economy and regionalism, and revitalizes existing rural residence.



Figure 13 Courtyard renderings.

5. CONCLUSION

The regeneration design of rural residence is discussed in this paper based on "old and new" symbiosis idea, and several insights are obtained. First of all, the essential characteristics, internal relevance and integration mode between the old and the new in regeneration design should be recognized. Secondly, on the basis of protecting and inheriting the historical context and combining the needs of specific service objects and functions, the old elements are integrated and reconstructed to promote the interconnection of space, structure, materials and culture between the old and the new, so as to continue the spiritual outlook of rural architecture and realize development of the rural residence.

AUTHORS' CONTRIBUTIONS

Siying Li is the author and designer of this study, completing the scheme research and design, and writing the first draft of the paper; Hao Ying guides the scheme design and thesis modification.

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