

Analysis of the Elements of the Cultural Ecological Environment of the Residential Buildings in Northeast China

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Abstract

With the rapid progress of urbanization and industrialization, the northeastern residential cultural ecology, which is in the midst of social transformation and modernity paradox, has become increasingly fragile and even overwhelmed. There is no doubt that in the process of social transformation in China, the cultural ecological crisis of urban communities is increasing, and it is threatening the normal operation of cultural ecology. The optimization of cultural ecology in the process of cultural changes in northeastern urban dwellings has become a social difficult problem that needs to be solved urgently. The purpose of this article is to conduct research on the analysis and overall protection of the elements of residential culture and ecological environment in Northeast China. Starting from the perspective of residential culture, this article takes the traditional residential houses of some traditional villages in Heilongjiang, Jilin and Liaoning provinces as the research object, and analyzes and sorts out the traditional residential culture of Northeast China through the method of literature data, questionnaire survey and mathematical statistics. Investigation and research show that the construction and economic durability of Northeast residential buildings are needed by people, so we should continue to promote traditional residential buildings and actively promote their advantages in creating low energy consumption, high comfort, and making full use of natural resources.

Keywords

Northeast China; Residential Culture; Ecological Environment; Traditional Protection.

1. Introduction

Folk dwellings are an important part of the vernacular architectural heritage. It is the condensing of the wisdom and experience of the working people. With its simple but rich architectural form, it contains the bits and pieces of civilization and history [1-2]. However, as far as the current situation is concerned, the existing state of residential buildings in the Northeast is not optimistic. We are immersed in the convenience brought by science and technology, but ignore the harm of science and technology to the cultural and ecological environment. In recent years, countries in the world have been retaliated by environmental problems to varying degrees. We want to control or even transform the environment, and the environment tells us that people must conform to the environment, and our process of consuming the earth is actually reaping the consequences[3-4].

Many scholars have achieved good results in the impact on the cultural and ecological environment of residents. For example, Patrick Abercrombie believes that the destruction of residential buildings is the result of rapid urban expansion and expansion[5]. A large number of factories, new-style residential buildings, advertising signs, etc. squeeze and destroy the existing space of residential buildings. In the end, the expansion and expansion of the city will erode the natural landscape and cultural atmosphere of the residential houses. Based on his doctoral dissertation, Han Mo combed the historical environment of the northern towns and

towns that were and existed in modern times to the present. From the analysis and protection of residential houses research on historical culture from the perspective of architecture and historical landscape environment[6].

This research is based on "people-oriented" as the starting point. Through the investigation and research on the traditional houses of some villages in the three provinces of Northeast China, the contradiction between traditional houses and buildings in the Northeast is grasped, and these factors are sorted and summarized by the analytic hierarchy process [7-8], the intention is to build an evaluation system for the livability of traditional houses in Northeast China, summarize the status quo of the preservation of traditional houses in Northeast China, and provide reference and basis for the further opening of the protection of houses [9-10].

2. Analysis of the Elements of Cultural and Ecological Environment of Residents in Northeast China

2.1. Northeast Residential Cultural Ecological Environment

(1) Layout of Han Nationality Houses

1) Plane layout

In the rural areas of Northeast China, single-seat traditional residential buildings are mainly used, that is, the horizontal and vertical building units are combined and arranged. The exterior of the building is surrounded by walls to form a courtyard space, and the building units are connected by corridors or not used. Together constitute a three-in-one or four-in-one courtyard. This kind of courtyard has a certain degree of freedom. When economic conditions permit, it can be expanded into several courtyards and several sets of courtyards to meet the needs of large families. The division of courtyard walls can also ensure that the spaces of each courtyard are mutually exclusive.

2) Founder Courtyard

The traditional houses of the Han nationality in the Northeast area adhere to the world concept of "a place with a round sky", which is reflected in the courtyards are mostly square or rectangular. On the other hand, according to the land resource conditions, there are many places and plains in the Northeast area, and the area is relatively wide. In conformity with this natural condition, the arrangement of traditional houses is also more straightforward and will not affect the form of the courtyard due to lack of land.

3) Application of soil in traditional houses

The ecological energy-saving ideas of the traditional houses of the Northeast Han nationality are fully embodied in the selection of building materials. As a common building material for traditional dwellings, soil has good thermal insulation performance. The northeastern region has rich soil resources and diverse soil types. The traditional houses of the Han nationality in the Northeast make full use of this advantageous resource and widely use soil as a material in different places, ranging from the structural foundation of the house to the small ones such as pots, kang, and chimneys.

4) Application of wood in traditional houses

The northeast region is rich in forest resources, with diverse wood species and high quality. Therefore, wood has become a commonly used material for the construction of traditional houses of the Han nationality in the Northeast. Structural components such as beams, columns, arches, and rafters in construction, as well as enclosure components such as doors and windows, are all used It's wood.

(2) Layout of Manchu dwellings

1) Plane layout

Manchu dwellings mostly adopt square and open courtyard layouts, generally in the form of triple courtyards. The main houses are houses facing the north and the south. There are three and five rooms in the shape and size. Both sides of the main house are supplemented by east and west wing rooms, and the middle room of the main house is usually the main room, which also doubles as a kitchen. From the main house to the sides are the bedrooms. The Manchus regarded the West House as the most noble room in the house, called the Upper House, where the elders in the family lived. In the bedroom, there are inter-connected fire kang in three directions, and the fire kang connecting the east and west kang on the side of the gable is called "wanzi kang". There is usually a religious area for shamanistic sacrificial ceremonies inside the dwellings.

2) Manchu architectural elements

For traditional Manchu dwellings, religious beliefs, living habits and national traditions are the main factors affecting their shape, and these factors are more or less reflected in the art form outside the traditional dwellings.

3) Mud straw house

The brick thatched house is the most typical form of traditional Manchu dwellings in Northeast China. Its wall materials are mainly made of original natural materials such as adobe or pagoda. The surface material of the roof is usually made of straw, which is why it is named the adobe thatched house. The main structure of the traditional adobe thatched house is usually made of wood, and the window frames and doors are mostly made of wood. The overall shape of the residence is low, the roof slope is large, and the wall height is low. Although the traditional adobe thatched house does not have the new thermal insulation materials with high thermal insulation effect today, through the development experience from ancient times to the present, the villagers concluded that the use of grass ash, rice husk and other materials can play a role in the thermal insulation of the building envelope. However, with the continuous economic development and progress in the countryside, the traditional adobe thatched houses can no longer meet the living needs of the villagers in terms of environment and comfort. From the visits, the most traditional adobe thatched houses are rare.

4) Haiqing Room

Brick houses are also the main form of traditional Manchu dwellings in Northeast China. The main building materials of this kind of buildings are blue bricks. For Wula Street, which has a huge complex of Manchu dwellings, this material is indispensable for the construction and restoration of dwellings. The protection and supervision are not strong enough. The original craft of the blue brick material has disappeared in the market. It is replaced by the blue brick material similar to the texture of the red brick. The strength and hardness are far from the traditional materials, and the color is also inconsistent with traditional materials, local people can only use such materials in order to ensure the traditional style of such houses. As a result, post-renovated traditional houses fail to achieve the expected results in terms of appearance and quality.

2.2. Environmental Analysis of Traditional Residential Buildings in Northeast China

(1) Village environment

The preservation of traditional dwellings requires an overall environment, and traditional villages are such a carrier. In recent years, many traditional villages have been severely damaged, and the survey results are not optimistic. The more affluent villages have long been renewed, and the traditional houses in the village are very few. Except for a few poor villagers, they have basically been replaced by modern houses. Although the villagers have nostalgia for traditional houses, the simple forms of houses cannot meet the needs of modern life. Can only

be discarded, this embarrassing situation has caused the loss of the texture and appearance of the traditional village.

(2) Humanistic environment

The residential villages in the Northeast are widely distributed, all over the three provinces in the northeast. After the reform and opening up, huge changes have taken place in rural production lifestyles and architectural forms. Basically, rural areas in convenient transportation areas rarely retain traditional village appearances, and only a few traditional houses have not been demolished due to various reasons. But it is basically uninhabited. The existing traditional villages with primitive features in Northeast China basically exist in relatively remote and backward areas. Only limited by traffic, economic and human resources can the traditional villages and traditional houses be preserved.

2.3. Analytic Hierarchy Process

In judging and judging the relative importance of the existing plan, and judging the implementation degree of the existing plan based on the final calculation result.

$$a_j = a_j / \sum_{j=1}^m (a_j) / n \quad j=1,2,3,\dots,m \quad (1)$$

In order to meet the data usage habits, the data is normalized

$$a_j = a_j / \sum_{j=1}^m (a_j) \quad (2)$$

3. Experimental Research on the Environmental Impact of Residential Houses in Northeast China

3.1. Consultation Object

Since this thesis is the research object of the residential cultural and ecological environment in the Northeast, out of regional considerations, the subjects of this questionnaire survey are related professional professors in the Northeast and Northeast China who have a better understanding of the traditional residential and surrounding environment in the Northeast. Experts in the field of folklore, as well as staff of design institutes with long-term practical experience. Experts' academic level, practical experience and understanding of related majors are important basis for the selection of experts in the questionnaire survey. The academic level of experts in this study is measured by the level of the position. The higher the position, the higher the academic level of the expert, and the more reliable the results of the questionnaire will be.

3.2. Research Objects

In order to study and protect the cultural and ecological environment of residential buildings in Northeast China, the research object of this thesis is the environmental changes around residential buildings. Ecological destruction means the deterioration of the residential cultural and ecological environment. This study investigated the residential ecological environment of the Han and Manchus.

3.3. Questionnaire Survey Method

The questionnaire used in this study is based on consulting a large number of documents, according to the purpose and content of the research, after many consultations with experts, the research indicators are selected, and the principles and requirements of the questionnaire

are followed. The questionnaire adopts semi-open and closed answer methods, and its purpose is to promote teachers and students to fill in correctly.

3.4. Mathematical Statistics

Use software to perform statistical processing on relevant data and analyze relevant data.

4. Experimental Analysis of Residential Environmental Impact in Northeast China

4.1. Analysis of Residential Performance

The Northeast has a vast territory and a large population. With the need for economic development and improvement of their own living conditions, residents have put forward higher requirements for the quality of the living environment. Whether the performance of the residential buildings meets the lives of modern people is a big problem, and it is also what we do. Questions that need to be understood urgently, Table 1 is a survey on the performance of residential buildings in Northeast China (satisfaction is 1-10).

Table 1. Residential performance survey form

	Residential construction performance	Residential material properties	Equipment performance	Durable performance
Han nationality	7	8	4	5
Manchu	6	7	5	5

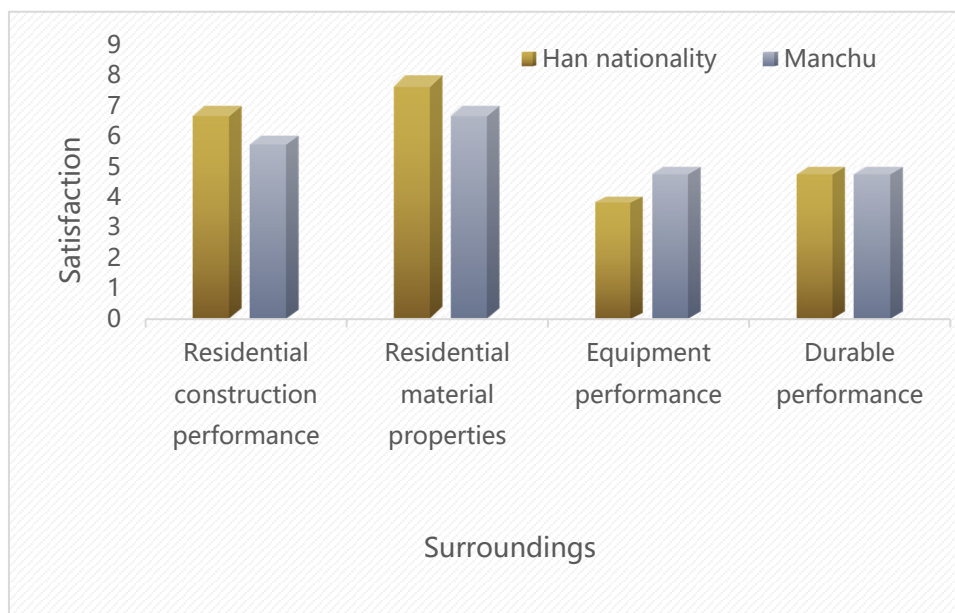


Figure 1. Residential performance survey form

It can be seen from Figure 1 that experts believe that the construction performance and material performance of residential buildings can meet people's living needs, but the equipment performance is not enough to support the higher demands of people in modern technological society.

4.2. Analysis of Residential Environment

Our country has achieved unprecedented development in recent years. However, most of the residential houses are facing the deterioration of the cultural ecological environment, and the environment for cultural development is getting worse and worse, which has become a hazard to the people's livelihood and the pain of the people's heart. Table 2 is a questionnaire for the analysis of residential environment (satisfaction is 1-10).

Table 2. Analysis of residential environment

	Road traffic environment	Green planting landscape environment	Natural landscape environment	Other environment
Han nationality	5	5	3	4
Manchu	6	4	2	4

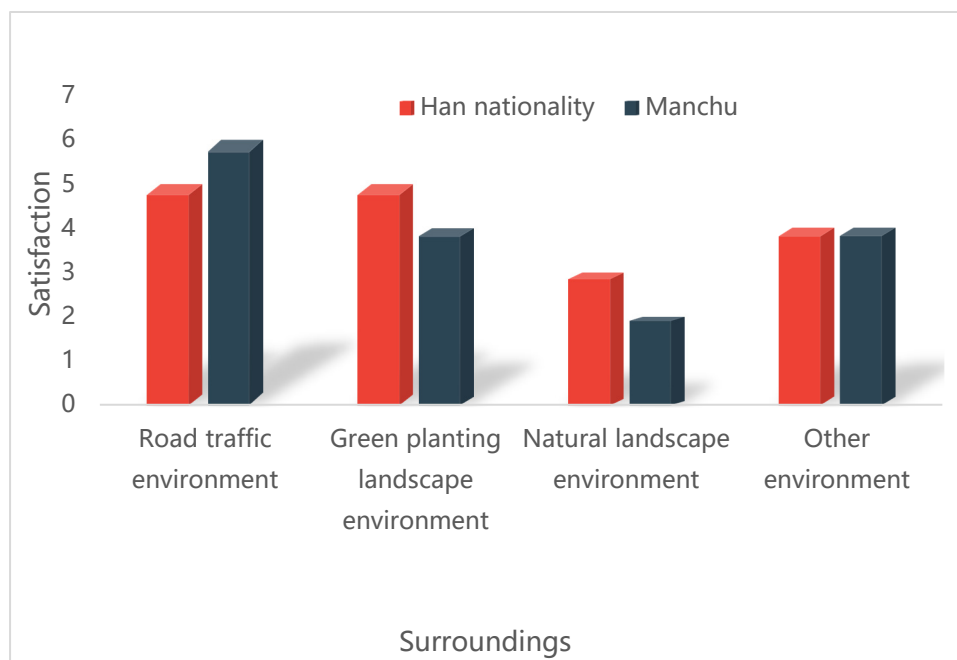


Figure 2. Analysis of residential environment

It can be seen from Figure 2 that most people believe that the cultural and ecological environment of residents in Northeast China has been damaged to varying degrees. Among them, the natural landscape environment has the most serious impact. The road landscape environment and the green plant landscape environment are relatively less affected, but they are also affected.

5. Conclusion

The residential buildings in the Northeast are the result of the local residents' integration with the natural environment through continuous consideration and practice, and the traditional native residential buildings have also transformed the natural environment in some ways. They are suitable for the local climate, natural geography, and local materials. Traditional residential buildings in Northeast China use simple materials such as wood, stone, soil, and wheatgrass to build a comfortable building that is suitable for people to live in, warm in winter and cool in summer. Folk houses have a strong ecological character, which is reflected in the full adaptation

of traditional dwellings to nature in terms of energy conservation and environmental protection, and thermal comfort of courtyard greening. In the explanation of this article, it is believed that the architectural design should continue to promote traditional habitats, and actively promote its creation of low energy consumption, high comfort, and full use of natural resources. Experts' multiple investigations have also shown that traditional houses in Northeast China have many advantages that do not exist in modern architecture, such as ecology and economy. At this point, modern architecture can absorb the advantages of traditional dwellings. Traditional living-soil dwellings have advantages and disadvantages for modern times. They cannot be used in modern architectural design. Therefore, we need to improve and innovate traditional dwellings and use modern technology to inherit and develop traditional dwellings.

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