



Analysis of Traditional Chinese Residential House Transformation Based on Bibliometric Research

Zijun Li

School of Architecture, Southwest Minzu University, Chengdu, China
Email: 1045013987@qq.com

How to cite this paper: Li, Z.J. (2023) Analysis of Traditional Chinese Residential House Transformation Based on Bibliometric Research. *Open Access Library Journal*, 10: e10559.
<https://doi.org/10.4236/oalib.1110559>

Received: July 30, 2023

Accepted: August 26, 2023

Published: August 29, 2023

Copyright © 2023 by author(s) and Open Access Library Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

The transformation of traditional residential houses plays a significant role in conserving architectural resources, preserving the distinctive cultural heritage of the region, and promoting rural revitalization. This study examines research on traditional residential house transformation from the CNKI (China National Knowledge Infrastructure) database, covering the period between 2000 and June 2023. The analysis is conducted using the CiteSpace visualization software to explore the current state and research trends related to traditional Chinese residential house transformation. The results indicate that the research in the field of traditional residential house transformation primarily focuses on heritage preservation, environmental adaptability, optimization of spatial functionality, technological applications, and resident participation. In the future, there is potential to enrich the research in areas such as transforming traditional houses into region-specific rural tourism resources, implementing passive energy-saving techniques, and enhancing residential comfort.

Subject Areas

Architecture

Keywords

Traditional Chinese Residential House Transformation, Knowledge, Graph, CiteSpace, Research Review

1. Introduction

Traditional dwellings bear a rich historical and cultural architectural heritage. In the context of pastoral and agrarian societies, the residents of traditional dwell-

lings had adapted living environments and lifestyles. However, with the advent of socialist modernization, there was a significant shift in people's ways of life and production. The former housing patterns were no longer suitable for these changing living patterns [1]. Therefore, the transformation of traditional dwellings became one of the most economical solutions during that time. Successful transformations not only enhance local cultural appeal but also contribute to the establishment of distinctive regional village or urban identities [2].

Research on traditional Chinese dwellings can be broadly categorized into the pioneering period before the founding of the People's Republic of China and the developmental period thereafter. The developmental phase is further divided into three stages [3]. The study of traditional dwelling transformations mainly falls under the third stage of rapid development in Chinese dwelling research during the 1980s and 1990s. Worth mentioning is that, driven by the advancement of modernization, rural revitalization policies, and the rise of rural tourism, research on the transformation of traditional dwellings has been continuously supplemented and explored. Scholars have been dedicated to uncovering the value of traditional dwellings, making it a prominent research focus in the deepening stage of dwelling studies [4] from the 21st century onwards. Based on CNKI's search results, the research on traditional dwelling transformation closely relates to issues of cultural heritage preservation, modernization, environmental sustainability, and community engagement. However, there is a scarcity of literature reviews specifically concerning the transformation of traditional dwellings, especially those employing quantitative methods for comprehensive analysis.

To address this gap, this paper adopts a bibliometric research approach, utilizing CiteSpace 6.2.R4 as a visualization and analytical tool for literature. It examines relevant literature on the transformation of traditional Chinese dwellings from the CNKI database covering the period from January 1, 2000, to June 1, 2023. The primary objectives are as follows: firstly, to summarize the research progress in the transformation of traditional dwellings; secondly, to analyze co-occurrence and burst keywords networks related to traditional dwelling transformation; and thirdly, to gain insights into future research hotspots and directions.

2. Data Sources and Research Methodology

2.1. Data Sources and Data Samples

The article was retrieved from the China National Knowledge Infrastructure (CNKI) with the keyword 'transformation of traditional dwellings'. Due to the limited number of relevant articles published on CNKI in the 20th century, with no more than three articles per year and limited reference value, the literature search was confined to the period from 2000 to June 2023. To ensure data reliability, literature pertaining to research was manually selected, resulting in the retrieval of 207 theses and dissertations, 126 journal articles with funding support,

and 2 books. This yielded a total of 335 valid research data samples.

In the year 2015, rural tourism became part of the national development strategy, propelling rural tourism towards high-speed and high-quality growth. The number of articles related to the transformation of traditional dwellings in 2015 was twice that of the previous year. This led to an explosive growth in rural tourism and a substantial increase in research output concerning the transformation of traditional rural dwellings, with the number of publications multiplying each year (as shown in **Figure 1**).

2.2. Research Methodology and Research Process

Literature metrics is a powerful method for quantitative analysis of literature. To a certain extent, it can mitigate individual subjectivity and arbitrariness, enabling readers to quickly grasp the current research status and hotspots in relevant fields.

CiteSpace, developed by Professor Chaomei Chen, is a quantitative software for visualizing and analyzing literature [5]. The software is primarily inspired by Derek John de Solla Price's theory of scientific frontiers and the structural holes theory of social network analysis. Its main function is to transform a large amount of literature data into visual charts, aiding researchers in discovering and comprehending the relationships and trends among literature. Using CiteSpace, users can explore the knowledge network and research dynamics within an academic field in a graphical manner. In this study, CiteSpace 6.2.R4 was employed as the tool for visualizing and analyzing literature. The data collected from CNKI was formatted for output using RefWorks. The time span covered from January 1, 2000 to June 1, 2023, with a yearly segmentation. The pruning methods included pathfinder pruning, merging networks, and slice pruning, with the remaining parameters set to default values. The specific research framework is illustrated in **Figure 2** and organized as follows.

The first step involves preliminary searching using CNKI keywords. The second step narrows down the search results based on the time range, eliminating articles unrelated to the topic and selecting relevant research-oriented academic papers. The third step entails analysis of keyword co-occurrence network and keyword burst detection (identifying emergent literature bursts). Based on the keyword co-occurrence network, the literature is categorized, summarized, and analyzed to discuss research strengths, weaknesses, and gaps. The fourth step involves summarization and recommendations, exploring potential future research hotspots.

3. Analysis of Research Hotspots and Trends in Traditional Residential House Transformation

3.1. Keyword Co-Occurrence Analysis

Analyzing keywords can effectively grasp the hotspots in the relevant research field. By running the CiteSpace software, with the year slicing set to one year and using default filtering and related calculation methods, we obtained the keyword co-occurrence map shown in **Figure 2**. In this map, the size of each pie chart

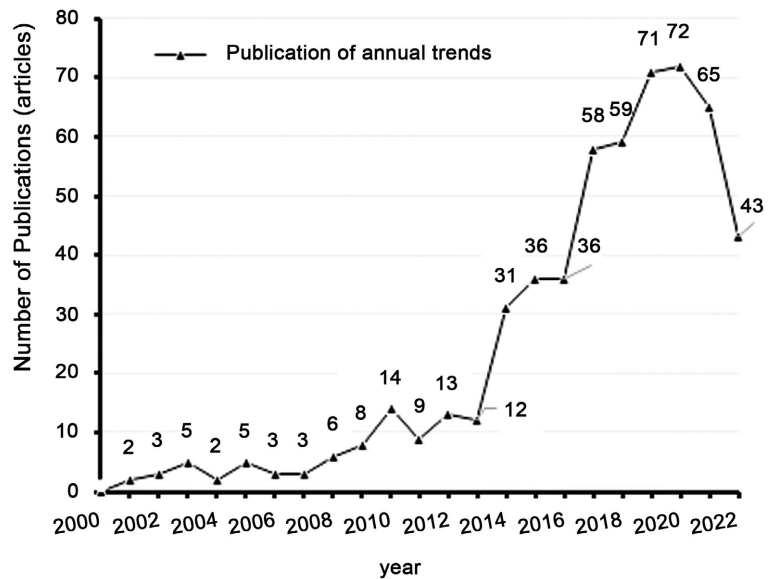


Figure 1. Basic situation of domestic traditional residential renovation research literature (source of the picture: Compiled and Drawn from CNKI Search in China).

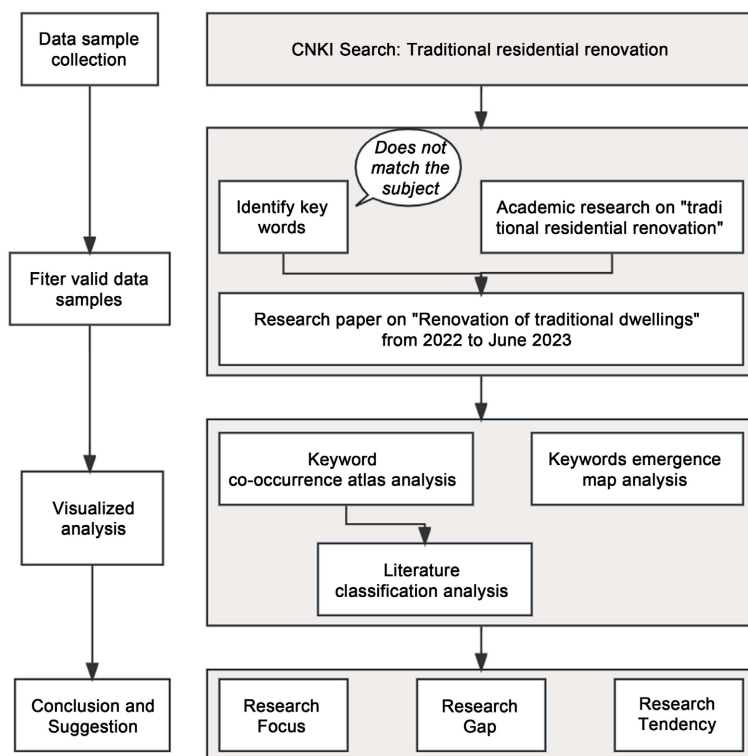


Figure 2. Research framework (source of the picture: Drawn by oneself).

represents the frequency of appearance of the corresponding keyword. Larger pie charts indicate higher frequencies, while smaller ones indicate lower frequencies. Additionally, the connections between keywords in the map illustrate their relationships in terms of co-occurrence.

To gain a clearer understanding of the frequency and centrality (degree of closeness) of the keywords, we conducted a statistical analysis of the top 20 keywords in terms of appearance frequency. From **Figure 3**, we can observe that the hot topics in the research field include heritage preservation, traditional villages, residential house transformation, rural tourism, renovation, and rural guesthouses. Based on the above analysis, it is evident that scholars pay significant attention to traditional residential house transformation and its preservation. Furthermore, there is considerable interest among researchers in the rural guesthouses derived from rural tourism and energy-efficient renovations related to achieving carbon neutrality. Although the frequencies of keywords such as traditional villages, rural tourism, guesthouses, and energy-efficient renovations are lower compared to transformation and preservation, they demonstrate a certain degree of relevance to national policies. Therefore, they can serve as crucial entry points for studying issues related to traditional residential house transformation.

Based on the co-occurrence analysis of the above keywords, domestic research on traditional residential transformation in China mainly falls into the following categories:

- Preservation and Heritage:

Many studies are devoted to preserving the historical and cultural value of traditional residential buildings by researching and conserving their original structures, materials, and construction techniques to ensure the integrity of their traditional features. In recent years, with rapid urbanization, there has been a proliferation of “bamboo tube buildings”, leading to the loss of local architectural culture. Due to a lack of management and maintenance, issues such as bulging walls and peeling finishes frequently occur, significantly impacting the local architectural landscape. In response to this context, the Yangshuo Dongling Transformation Area project proposes suitable façade renovation measures, combining semiotics and regional culture to maintain the architectural style of Guibei traditional residences on Yangshuo West Street [6]. The use of semiotics in the transformation design of residential exteriors tends to result in a monotonous architectural style and overlooks public participation, potentially leading to a phenomenon of “one size fits all” [7]. Although this method is only a partial solution, it helps save transformation costs to some extent, improve the urban landscape, and provide references for urban construction. In the process of exploring residential transformation measures, scholars have increasingly focused on qualitative and quantitative analysis of color application, enhancing visual impressions, and exploring their underlying cultural connotations, advocating for controlled and guided color applications in transformation projects [8]. For the improvement of rural appearance, the funding project in Yingtan Village, Hebei Province, provides a good demonstration by advocating the continuity of original paving materials in residential areas and the cautious use of modern materials. It adopts a combination of traditional and modern facilities for villagers, unifying sewage and garbage collection. A series of landscape transformation

modern thermal insulation, reinforcing traditional materials to minimize their disadvantages. For instance, the thermal insulation renovation of the building's enclosing structure and the optimization and reinforcement of the load-bearing structure [11] [12] can reduce construction waste and carbon emissions, improve living comfort, and achieve the ecological sustainability of traditional residences.

The renovation of residential buildings should not excessively pursue modern spatial effects, as traditional residential buildings already possess excellent passive energy-saving measures and adaptability to the natural environment. Contemporary architectural design can leverage modern tools for physical measurements, use energy-efficient materials, and employ energy-saving simulations using computer software such as the commonly used comprehensive building performance simulation software Ecotect. This approach can achieve a balance between resource conservation, improved living comfort, and reduced carbon emissions, ultimately leading to the most suitable design and renovation solutions [13]. Some scholars also focus on researching the combination of modern building materials with locally common materials to enhance the insulation and thermal efficiency of residential buildings, exploring strategies for low-energy ecological transformations of dwellings [14].

- Spatial Function Optimization:

Changes in modern lifestyles necessitate the optimization and transformation of traditional residential spaces. Researchers re-plan internal spaces to increase comfort and convenience to meet the needs of residents. Some scholars conduct classification analysis through surveys and drawings of typical traditional residences to explore suitable residential transformation strategies, intending to combine the updates of residential buildings with the traditional lifestyles of local residents for the sustainable development of residential areas. For areas with potential for tourism development, revitalizing the residential areas and implementing functional replacements, such as introducing locally characteristic B&Bs, shops, and teahouses to provide tourist resources [15]. There are also studies that start with the villages and surrounding natural environment, advocating for continuity in the village's texture and cultural context. Combined with modern living requirements, typical residential areas are re-designed and transformed, with a focus on cultural heritage, transportation methods, living habits, green planting, and color applications. Relevant transformation measures are proposed to create new rural areas with local characteristics [16]. The rise of rural tourism has led to a trend of transforming residential areas into rural B&Bs. Rural B&Bs integrate the architectural cultures of traditional residences and tourist accommodations, not only increasing local income but also preserving cultural heritage, continuing local historical contexts, and enhancing their competitiveness in the B&B market [17]. However, in the process of rural tourism development, care should be taken to avoid homogenization, excessive development, and neglect of local cultural continuity [18].

- Technological Applications:

The application of new technologies has also become one of the research directions in traditional residential transformation. For instance, smart home technology, renewable energy systems, and building automation systems are utilized to enhance the functionality and convenience of traditional residences.

Scholars from Tsinghua University, such as Sun Na and Luo Deyin, conducted practical renovation experiments on traditional dwellings of the Hani ethnic minority. They retained the thatched roof and rammed earth walls while increasing the height of the ground floor. They improved the interior wall finishes and introduced better lighting and ventilation, ensuring that the mushroom houses preserved the traditional residential style while meeting the modern needs of the residents [19]. This study provides reference and guidance for similar ethnic minority regions in their residential transformations. Addressing the issue of outdated heating in traditional residences, the renovation of old dwellings in Yantai incorporated geothermal and solar hot water systems to redesign the Kang (a traditional Chinese heated brick bed) [20]. This approach respects local residents' living habits and ensures energy efficiency, ecological friendliness, and sustainability.

- **Community Engagement:**

Community participation and feedback are essential considerations in traditional residential transformation. Researchers collaborate with residents, listen to their opinions and needs, and maintain cultural identity to ensure that the transformation process aligns with the community's expectations and interests.

Due to varying living habits and different levels of emphasis on cultural heritage protection in different regions, creating a well-preserved and aesthetically pleasing village requires the joint participation of the government and local residents [21]. This involves preserving and continuing the excellent local construction techniques, promoting and propagating architectural culture, and enhancing local residents' cultural identity. Addressing the division between tradition and modernity requires architects to carefully consider the opinions and needs of local craftsmen and residents, designing transformation plans that gain local residents' approval [22].

It is important to note that the current status of traditional residential transformation research may vary in different regions and cultural backgrounds. Architectural styles, cultural traditions, and environmental conditions in different areas will influence the research direction and practical approaches. Therefore, for specific traditional residential transformation projects, local characteristics and needs must be comprehensively considered to develop suitable transformation strategies.

3.2. Keyword Emergence Analysis

The emergence of keywords reflects the surge of interest among scholars within a specific time frame. Analyzing **Figure 4** allows us to identify different research hotspots in various time periods and also predict potential future research

Top 12 Keywords with the Strongest Citation Bursts

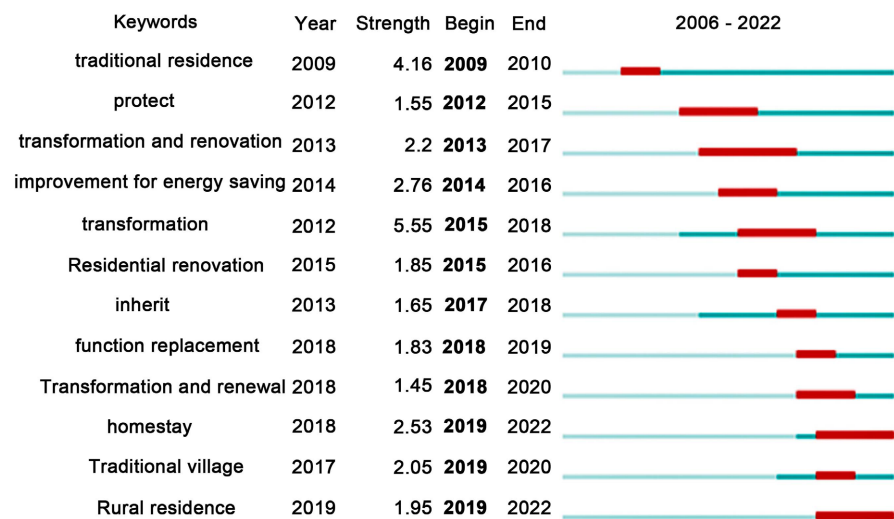


Figure 4. Keyword emergence analysis of traditional residential transformation from 2000 to June 2023 (source of the picture: Compiled and Drawn from CNKI Search in China).

trends. As depicted in **Figure 4**, the emergence of traditional residential transformation occurred in 2009, while the focus on preservation appeared in 2012. The attention on renovation and refurbishment peaked from 2013 to 2017, and energy-efficient transformation surged between 2014 and 2016. The rise of topics related to rural homestays and rural residences emerged in 2019 and continues to be relevant. Overall, it is evident that the prominence of traditional residential transformation and refurbishment has been the most sustained, while rural homestays and rural residences are likely to become the future research hotspots.

4. Conclusion and Suggestion

The visualization analysis of 335 relevant literature on the transformation of traditional Chinese dwellings from the China National Knowledge Infrastructure (CNKI) using CiteSpace software provides valuable insights into research trends, evolution, and publication patterns. Over the period from 2000 to June 2023, there has been a rapid growth in the number of publications related to traditional dwelling transformation, particularly in recent years, which reflects the increasing national emphasis on preserving and inheriting traditional culture. Topics such as the revitalization of traditional dwellings, the transformation of region-specific architectural features, rural tourism, and rural revitalization are anticipated to be key research areas in the future.

From the core literature on traditional dwelling transformation, it is evident that the research journey has evolved from defining traditional dwellings to exploring their regional adaptations and the recent trend of transforming them into homestays. Four key themes emerge:

1) **Balancing Historical and Cultural Heritage with Modern Needs:** Scholars recognize the importance of extracting and translating architectural cultural symbols in the context of traditional dwelling transformation. While some historic and distinctive traditional dwellings opt for minimal intervention to ensure authenticity, most prioritize residents' comfort and explore ways to seamlessly blend traditional and modern elements, prioritizing both architectural culture and functional comfort.

2) **Emphasizing Environmental Sustainability:** With heightened awareness of environmental issues, sustainable practices have gained prominence in traditional dwelling transformation. Scholars demonstrate that efficient energy use significantly enhances living comfort and contributes to green, energy-efficient, and sustainable development.

3) **Community Engagement and Social Benefits:** Encouraging local participation in dwelling transformation ensures that projects align with both government mandates and community expectations. This approach not only strengthens community cohesion but also enhances tourism attractiveness, thereby yielding substantial social benefits.

4) **Leveraging Modern Technology and Digitization:** The strategic incorporation of modern technology and digital tools significantly enhances the efficiency and accuracy of traditional dwelling transformation processes.

To sum up, the following five suggestions are put forward for the renovation of traditional residential buildings.

1) **In-Depth Exploration of Traditional Techniques and Materials:** Further delve into the architectural techniques and materials of traditional dwellings to unearth their unique characteristics and explore how these can be seamlessly integrated into modern transformations. This approach safeguards and perpetuates traditional culture.

2) **Interdisciplinary Collaboration:** Traditional dwelling transformation demands interdisciplinary collaboration encompassing fields such as architecture, anthropology, and history. Interdisciplinary cooperation can provide holistic perspectives and innovative solutions for transformation projects.

3) **Research on Societal and Cultural Impacts:** Extend research into the societal and cultural impacts of traditional dwelling transformation, including community dynamics and changes in residents' lifestyles. This perspective better elucidates the contributions and effects of such transformations on society.

4) **Case Studies and On-Site Research:** Conduct on-site research and case studies to gain comprehensive insights into real-world transformation scenarios, augmenting academic research with empirical data.

5) **Promotion and Knowledge Dissemination:** Beyond scholarly endeavors, actively disseminate successful experiences in traditional dwelling transformation to enhance public awareness of cultural preservation and modern adaptations.

Traditional dwellings are deeply intertwined with people's lives and hold significant cultural importance. In addition to showcasing regional cultural characteristics, transformation strategies must align with residents' needs. Tailored ap-

proaches based on individual contexts are pivotal for the inheritance, sustainable development, and high-quality evolution of traditional Chinese dwellings, warranting ongoing exploration.

Conflicts of Interest

The author declares no conflicts of interest.

References

- [1] Shan, D.Q. (1992) On the Transformation of Traditional Residential Villages in China. *Journal of Architecture*, No. 4, 8-11.
- [2] Li, M. and Xu, H.X. (2007) On the Tourism Development of Urban Traditional Residences: A Case Study of Shanghai Shikumen. *Academic Exchange*, No. 10, 119-122.
- [3] Lu, Y.D. (2007) Fifty Years of Research on Chinese Residential Buildings. *Journal of Architecture*, No. 11, 66-69.
- [4] Wang, H.Y., Gao, X.G. and Bai, Q. (2022) A Review and Prospect of the Research on Historical Residential Buildings in China in Recent Years. *Jinyang Journal*, No. 5, 140-145.
- [5] Chen, Y., Chen, C.M., Liu, Z.Y., *et al.* (2015) Methodological Function of CiteSpace Knowledge Map. *Studies in Science of Science*, **33**, 242-253.
- [6] Huang, X.T. and Ye, B.Y. (2009) Continuity and Reshaping of Architectural Style in the Rural House Transformation Process: A Case Study of the Facade Transformation of Zhutonglou Buildings in Dongling, Yangshuo. *Planner*, **25**, 47-50.
- [7] Liu, C.J. (2012) Review of Traditional Tibetan Residential Buildings in Western Sichuan. *Decoration*, No. 7, 125-126.
- [8] Wang, H.Y. (2010) Color Design in the Renovation of Historical Residential Buildings. *Literary Research*, No. 6, 141-142.
- [9] Shen, Y., Mei, Y.L. and Xu, N. (2013) The Beneficial Impact of Folk Wisdom and Giving Back to the Community: Rural Appearance Transformation and Enhancement of Yingtan Historic Village. *Journal of Architecture*, No. 12, 6.
- [10] Li, X.P. and Liu, J. (2022) Research on the Energy-Saving Renovation Design of Traditional Residential Buildings in Suzhou Water Town. *Journal of Xi'an University of Technology*, **38**, 394-401.
- [11] Wang, P., Zhang, J., Sun, B.S. and Zhou, Z. (2011) Analysis of Traditional Wooden Structure Residential Building Transformation in Southwest Rural Areas. *Journal of Anhui Agricultural Sciences*, **39**, 12979-12980+13095.
- [12] Li, Z.R., Zeng, S.Q., Zhao, Q., *et al.* (2016) Influence of the Traditional Residential Enclosure Structure Transformation on the Indoor Thermal and Humidity Environment in Guizhou Deman Dong Village. *Journal of Xi'an University of Architecture & Technology (Natural Science Edition)*, **48**, 908-911.
- [13] Liang, L., Zhang, K.N., Lu, Q., *et al.* (2013) Practice of Building Performance Simulation in Lingnan Traditional Residential Building Renovation Projects: A Case Study of New Buildings within the Existing Site. *Journal of Architecture*, No. S2, 38-44.
- [14] Yang, W.J., Gao, Q., Xu, B., *et al.* (2015) Inheritance and Transformation of Low Energy Consumption Technology for Traditional Riverside Residential Buildings in Jiangnan Water Towns. *Journal of Architecture*, No. 2, 66-69.

-
- [15] Li, G.H. and Jia, T.L. (2007) Transformation of Typical Residential Buildings in Dapeng Suocheng. *Journal of Architecture*, No. 12, 78-81.
- [16] Yun, Y. and Chuanyin, Y. (2008) Han-Style New Residential Buildings: Planning and Design of Natural Villages in Jiangxia District, Wuhan. *Journal of Architecture*, No. 11, 56-59.
- [17] Li, X.F. (2018) The Fusion of Rural Guesthouses: The Road to Rebirth of Atypical Ancient Villages. *Journal of Nanjing Institute of Arts & Design (Fine Arts & Design)*, No. 3, 140-144.
- [18] Zhong, Z.Y., Jin, K. and Chen, Z.Z. (2021) Research on the Space Renewal Strategy of Traditional Villages' Residential Buildings under the Background of Tourism in Western Hunan. *Furniture & Interior Decoration*, No. 3, 134-136.
- [19] Sun, N. and Luo, D.Y. (2013) Transformation Experiment of Hani Traditional Residential Buildings. *Journal of Architecture*, No. 12, 38-43.
- [20] Qiao, W.G., Sui, J.L. and Wang, S.L. (2016) Discussion on the Renovation of Old Residential Buildings in Suochengli, Yantai. *Industrial Architecture*, **46**, 50-53.
- [21] Wu, X.Y. and Wang, B.C. (2014) Research on the Transformation of Dangerous Houses and the Protection of Traditional Residential Buildings of Minority Nationalities: A Case Study of Leishan County, Guizhou. *Journal of Southwest Minzu University (Humanities & Social Sciences Edition)*, **35**, 46-50.
- [22] Liu, C.Q. (2018) Dwelling and Building: Traditional Residential Transformation from the Perspective of Geography. *Journal of Guangxi University for Nationalities (Philosophy and Social Science Edition)*, **40**, 8-18.