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A Review of Research on the Satisfaction Evaluation of Rural Prefabricated Housing Residents

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Abstract

In the development of rural revitalization, the construction of livable villages has become a new goal and focus. In recent years, the state has vigorously advocated green building and sustainable development, and introduced a series of policies to support the development of prefabricated buildings. Residents' satisfaction has become the focus of attention, which has an important impact on the development of rural prefabricated housing. Therefore, it is necessary to summarize the related research on prefabricated housing and satisfaction degree. This paper will summarize from the perspective of evaluation research, and provide a new research idea for the evaluation research of prefabricated housing.

Keywords

Prefabricated house, Satisfaction, Evaluation studyr.

1. Research Significance and Background

1.1. Research background

During the "13th Five-Year Plan" period, the State vigorously promoted the development of rural prefabricated housing, the Ministry of Housing and Urban-Rural Development in order to implement the relevant guidance of The State Council, promote and develop prefabricated buildings in all aspects, issued the "13th Five-Year Plan" prefabricated building Action Plan, "prefabricated building demonstration city Management Measures," prefabricated building industrial base management Measures," It provides relevant guidance and certain development basis for rural prefabricated housing [1]. During the "14th Five-Year Plan" period, the Ministry of Housing and Urban-Rural Development issued the "14th Five-Year Plan" Construction Industry Development Plan, requiring the vigorous development of prefabricated buildings. Due to the innovative development of prefabricated buildings in its construction mode, construction technology, construction materials and construction organization, rural prefabricated houses are a new development direction and trend in the process of livable rural development [2].

In recent years, the development of the country has entered a new stage, and the development of the construction industry has also made new plans and requirements. In the 13th Five-Year Plan, in order to promote supply-side structural reform and new-type urbanization development, the state requires the development of prefabricated buildings [3].

Under the background of the construction of beautiful and livable countryside, the development of rural areas has become the focus of social attention. The continuous promotion of urbanization has changed the rural population structure, and more and more rural residents are eager to have a more comfortable and modern living environment. However, the traditional rural housing construction period is long, often needs to consume a lot of time and energy, and there are problems such as unstable construction quality, which brings a lot of inconvenience to residents' life. The prefabricated housing adopts factory production, the quality of

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components is controllable, and the installation speed is fast, which can effectively meet the needs of rural residents for efficient construction [4]. The Ministry of Housing and Urban-Rural Development has also issued technical guidelines for prefabricated steel structure modules to make specifications and requirements for the technical quality of prefabricated buildings. Prefabricated housing, with its unique advantages, has brought new opportunities for rural housing construction and is a new development direction of rural housing in livable rural construction [5].

At the same time, the government actively responds to national policies and encourages farmers to adopt prefabricated housing through financial subsidies and technical guidance [3]. For example, in some areas, farmers who adopt prefabricated houses are given certain financial subsidies, and professional and technical personnel are organized to provide technical advice and services to farmers, which not only helps to improve the rural living environment, but also promotes the modernization process of rural construction. Through the guidance and support of national policies, a number of model pilot rural prefabricated housing has been built in various regions of the country. However, compared with traditional rural housing construction methods, the construction method of prefabricated housing is more complicated for rural residents, involving construction teams, construction plans and construction costs, and the acceptance of rural residents is generally not high. Due to the novelty of prefabricated houses and the impact of construction costs, most rural residents still choose the traditional way of building farm houses [6].

Therefore, in order to analyze and solve the development of prefabricated housing in rural areas, it is necessary to study the satisfaction of rural prefabricated housing.

1.2. Research significance

Rural prefabricated housing is a new development direction for livable rural construction and is of great significance for promoting rural revitalization, while rural prefabricated housing is still in the stage of exploration and development [7].Based on the research on the satisfaction of rural prefabricated houses, the evaluation index system of the satisfaction of rural prefabricated houses is established, the corresponding questionnaire is formulated for investigation, and the data is analyzed and processed at last. To construct the satisfaction evaluation system of rural prefabricated housing, through scientific research and theoretical analysis, has theoretical and practical significance for the development of rural prefabricated housing.

1) Theoretical significance

Rural prefabricated housing is a new mode of rural housing construction. At present, there are relatively few relevant theoretical studies, but the study of satisfaction can provide theoretical support for the development of rural prefabricated housing and enrich the theoretical system of rural housing construction.

The traditional building evaluation mainly focuses on the technical performance and comprehensive benefit of the building, but pays less attention to the user's satisfaction. The research on the satisfaction of rural prefabricated houses includes the needs and feelings of users into the evaluation system, and expands the theoretical perspective of building evaluation.

2) Practical significance

The study on the satisfaction of rural prefabricated houses can deeply understand the evaluation of farmers on the living comfort, functional practicality and building quality of prefabricated houses. Based on these feedbacks, the design and construction of prefabricated houses can be improved in a targeted manner to provide farmers with a more comfortable, safe and beautiful living environment, effectively improve the quality of life of farmers, and thus promote the development of prefabricated houses in rural areas [8].

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Prefabricated houses have the advantages of fast construction speed, high resource utilization rate and low environmental pollution [9]. Through the study of satisfaction degree, we can understand the cognition and feeling of farmers on energy saving and environmental protection of prefabricated houses, further promote the concept of green building and promote the sustainable development of rural areas.

2. Foreign Research Status

2.1. Research on prefabricated evaluation

Hong[10] adopted the input-output hybrid life cycle assessment (LCA) model to analyze the life cycle energy consumption of prefabricated buildings, and established the prefabricated benefit evaluation index system. Doan D et al. [11] studied a variety of different green evaluation systems such as BREEAM and LEED, and these evaluation systems differ in evaluation methods, emphasis and sustainability evaluation ability. He proposed to incorporate economic and institutional factors into the green building rating system as evaluation criteria, so as to improve the green evaluation system of prefabricated houses.

Based on the life cycle theory, Mohammad Kamali et al. [12] studied the life cycle sustainability performance of prefabricated houses, identified, ranked and evaluated potential sustainability performance standards (SPCS), innovatively introduced the concept of performance level, and used TOPSIS multi-criteria decision analysis method to make decisions. Diana Lopez[13] carried out cost-benefit analysis on two prefabricated housing construction methods, plate type and modular type, and concluded that both methods have their own advantages and advantages, which can bring better cost benefits. In addition, she established a cost-benefit decision evaluation system for two different construction methods. It can be used as a decision-making method to choose which construction method is more efficient. Bonamente[14] analyzed the carbon emission and energy footprint of prefabricated buildings, quantified the greenhouse gas emission and energy consumption of each life cycle stage, and evaluated the environmental benefits of prefabricated buildings. Aye[15] evaluated the energy requirements of prefabricated steel structures by using a hybrid energy assessment method, and concluded that the reuse of prefabricated modules could save energy. Guo[16] et al. established a quantitative evaluation model and conducted an empirical study through theoretical analysis of the influencing factors and mechanisms of prefabricated buildings on urban sustainable development, proving that prefabricated buildings have a positive orientation to urban sustainable development. Shi[17] et al. used the stochastic evolution model, evolutionary game theory and system dynamics to study relevant stakeholders, evaluated and analyzed the influence relationship between stakeholders and government regulation, and found that the collaborative driving mechanism can positively affect the development of prefabricated buildings.

2.2. Satisfaction study

Foreign research on satisfaction began in the 1920s and 1930s, mainly focusing on employee satisfaction and customer satisfaction, and then in the 1960s, some scholars also conducted research on residents' satisfaction.

Gross et al. [18] used thousands of respondents as samples in a quantitative study to explore the relationship between employee satisfaction and employee recommendation intention. The results show that with the improvement of employee satisfaction, they have a more positive attitude towards the recommending company or organization, that is, employee satisfaction is positively correlated with the recommendation tendency.

Balinado[19] et al. used the SERVQUAL method to determine the factors affecting customer satisfaction in the after-sales service of a certain model of Toyota. Based on the theory of

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relationship marketing, Malki Djihane et al. [20] studied the impact of Socail CRM on customer satisfaction and loyalty, conducted structural equation modeling on the data of surveyed customers, and concluded that traditional customer relationship marketing has more competitive advantages than social media marketing.

Ahmadi Ferial[21] conducted a survey on the satisfaction of residents of affordable housing in northern Iran. SmartPLS software was used for analysis and second-order confirmatory factor analysis evaluation to study the factors affecting the satisfaction of residents of affordable housing in Iran. Tang[22] et al. explored the factors affecting the residence satisfaction of low-income housing residents from the perspective of built environment and social environment.

3. Domestic Research Status

3.1. Research on prefabricated evaluation

Zhu Baifeng [23], taking the development status of prefabricated buildings and the greenness study as the starting point, constructed a three-dimensional model of greenness of prefabricated buildings based on "influence stage - influence factor - influence dimension", used network analysis and multi-level gray comprehensive evaluation to analyze and evaluate the examples, verified the feasibility of the evaluation index model constructed by him and solved practical problems. Wan Guangchun [24] summarized the research status at home and abroad and found that most of the current green construction grade evaluation studies are aimed at the traditional construction process. Based on the grey cluster evaluation theory, he established the green construction grade evaluation model of prefabricated buildings and analyzed it with specific examples. The evaluation results were consistent with the actual situation of the project. A set of suitable evaluation system model is formed. Zheng Jixing [25] conducted a study on the green evaluation of the whole life cycle of prefabricated buildings, built an evaluation index system based on the pressure-state-response theory, and established an evaluation model using the match-element extension theory, providing a new idea for the green evaluation of the whole life cycle of prefabricated buildings.

Liu Yunsheng [26] studied the low-carbon, energy-saving and environmental benefits of prefabricated houses in the context of carbon neutrality. He believed that the external comprehensive benefits of prefabricated houses should not only be studied, but the environmental benefits of prefabricated houses should also be paid attention to. Therefore, he used the DPSIR model to build the environmental benefits model of prefabricated houses. Through the demonstration and analysis, it is concluded that the environmental benefit of prefabricated housing in Jiangsu Province has been gradually improved.

Based on the concept of sustainable development, Zhang Wenlong [27] considered the factors restricting the development of prefabricated buildings from the four aspects of environmental quality, energy consumption, social benefit and economic benefit, selected the corresponding indicators, built a processing model with the grey system theory, and established a set of scientific and reasonable evaluation index system for the sustainable development of prefabricated buildings.

Duan Xiaoquan [28] evaluated and studied the comprehensive benefits of prefabricated buildings, but his research focused on the comprehensive benefits of the industrialization of prefabricated houses, and obtained the evaluation grade by studying the incremental cost and incremental benefits. Gao Ming [29] relies on matter-element extension model to evaluate the composite benefit of prefabricated buildings, which has certain innovations in determining index weights. He uses the combination of entropy weight -C-OWA operator to give weights, which better solves the fuzziness and uncertainty of the composite benefit evaluation system of prefabricated buildings. Xia Miao 30] determined the index weights through the analytic hierarchy process and entropy weight method, and also used the matter-element extension

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model evaluation method to conduct a comprehensive benefit evaluation study on prefabricated steel structure housing, screened out 19 evaluation indicators from the three levels of economic benefit, environmental benefit and social benefit, and reached a conclusion of a better level.

Wei Lin [31] evaluated the comprehensive benefit of prefabricated houses from the perspective of the whole life cycle, covering four dimensions of economy, society, environment and constructability. He used analytic hierarchy process to determine the weight of indicators and established a fuzzy comprehensive evaluation model, and drew a conclusion that economic benefit was related to assembly rate, and high assembly rate would inevitably lead to an increase in construction cost.

Yang Huiyuan [7] conducted research and analysis on the comprehensive benefits of prefabricated rural houses, compared the prefabricated rural houses with those built in traditional mode from three dimensions: process, management and cost, built the comprehensive benefits evaluation system of rural prefabricated residential houses, and tested the feasibility by fuzzy analysis and gray comprehensive evaluation methods. Although She Yuanbiao [32] also evaluated and studied the comprehensive benefits of rural prefabricated houses, he adopted matter-element extension model and came to the conclusion that construction cost affected the development of prefabricated houses in rural areas.

Based on entropy weight method and extension theory, Li Min [33] studied the life cycle risk of rural prefabricated houses. It uses the accident tree analysis method to identify risk factors, so as to build the whole life cycle risk index system of prefabricated houses, and carries out an example analysis through the entropy weight extension model to verify the effectiveness and feasibility of the model.

Based on stakeholder perspective, Teng Houqun [34] used evolutionary game theory and social network analysis to study the development strategy of rural prefabricated steel structure housing. By constructing and analyzing the social network model and stakeholder game model of rural prefabricated steel structure housing, he concluded that local government subsidies are an important factor affecting the development of prefabricated rural housing.

3.2. Satisfaction study

Yin Bohou et al. [35] investigated and studied the satisfaction degree of rural toilet reform with nearly 300 farmers in several districts and counties of Shaanxi Province. From the dimensions of toilet hardware, supporting management, economic benefits and scientific utilization, 20 individual indicators were selected to establish an evaluation index system for the effect of rural toilet reform.

Liu Yong [36] conducted a study on the satisfaction of households in the comprehensive reconstruction of the first batch of old residential areas in Shanghai, studied the relationship between the satisfaction of households and the evaluation of the reconstruction space and reconstruction methods, and explored the influencing factors of household satisfaction. Zhang Hengyu [37] studied the influencing factors of household satisfaction in 13 renovated old residential areas by establishing a structural equation model, and identified 5 important influencing factors.

Zhang Yan [38] studied the household satisfaction of commercial housing based on SEM structural equation model, built the household satisfaction model, analyzed the influencing factors, and finally proposed measures and suggestions to improve household satisfaction from the perspectives of the government, real estate enterprises and households.

Li Lihong [39] et al. studied the satisfaction of incentive policies for rural prefabricated buildings, systematically evaluated the policy satisfaction of different stakeholders by using K-W non-parametric testing and factor analysis, and finally constructed the policy IPA quadrant diagram to guide policy revision.

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Wang Guozheng [40] conducted an evolutionary game study on the prefabricated housing market based on consumer satisfaction. Through the establishment of a satisfaction model, the author conducted a survey on the residents of prefabricated houses, and used the structural equation model to process the satisfaction model data, and obtained the influential factors affecting the satisfaction of prefabricated housing consumers. After analyzing the processed model data, the author used the evolutionary game theory to find out the equilibrium point of the prefabricated housing market, and finally proposed the corresponding development strategy.

4. Conclusion

Based on the analysis of the research status at home and abroad, the current evaluation studies on assembly type at home and abroad are mostly comprehensive benefit, greenness or green grade evaluation studies, and satisfaction studies are mostly employee satisfaction and customer satisfaction surveys. Although some scholars have carried out relevant studies on the satisfaction of farmers' toilet reform projects and the satisfaction of households in the reconstruction of old residential areas with the satisfaction of residents as the starting point, there are not many studies on the satisfaction of prefabricated houses in rural areas. Therefore, it is necessary and significant to combine the study of prefabricated housing evaluation with the study of satisfaction degree in order to solve the problem of prefabricated housing development in rural areas.

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