Game Analysis between Government, Green Builders and Consumers Based on Fuzzy Numbers under the Transformation of New and Old Kinetic Energy

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Abstract: the Traditional Architectural Model Can Design and Build a Large Number of Buildings, But At the Same Time Generate a Lot of Waste and Construction Waste. Moreover, Because the Construction Purpose is Mostly Biased Towards Project Profitability, Coupled with the Constraints of Construction Technology, It Often Results in Short Building Life and Rapid Elimination of Overall Design. in This Regard, in the Development Background of the New and Old Kinetic Energy Conversion, Based on the Fuzzy Number Analysis Method, the Three Game Relationship between the Government, Green Builders and Consumers is Discussed. through in-Depth Analysis and Exploration, We Will Further Clarify the Game Mechanism of the Three Parties' Interest Groups, Thus Providing Some Development Ideas for the Development of Green Building Industry.

1. Introduction

1.1 Literature Review

As the Global Ecological Environment Becomes More and More Prominent, Sustainable Development Has Gradually Become a Key Factor in Social and Economic Development. in This Regard, Many Scholars and Experts in the Construction Industry Have Discussed the Green Building Industry. Yang Deyan and Liu Jian Scholars Analyzed the Game Relationship between the Government and Green Manufacturers Based on Fuzzy Numbers. by Combining Game Theory with Triangular Fuzzy Numbers, the Fuzzy Game Model of Government and Green Manufacturers is Constructed. in Various Situations, the Government and Green Manufacturers Choose Different Strategies and Get Inconsistent Game Results. in Terms of Adopting Green Manufacturing Models, Government Subsidies and Penalties Are More Effective (Yang and Liu, 2016). Zheng Shigang and Other Scholars Analyzed the Game Results of Green Building Related Interest Groups Based on the Perspective of Green Building Value Chain. in the Green Building Industry Value Chain, There Are a Number of Related Interests, Including Government, Real Estate Development Companies, Consumers, Suppliers and Recycling Companies. the Game Results of Multiple Related Interests Constitute the “Prisoner's Dilemma”, Which Leads to the Nash Equilibrium Phenomenon (Zheng et al, 2012). Yan Jianyuan and Other Scholars Constructed the Stackelberg Differential Game Model of the Government and Developers. under the Condition of Time Change, Analyze the Dynamic Pricing of Green Buildings and Obtain the Optimal Strategy According to the Model (Yan et al, 2017).

1.2 Research Purposes

In the current building market, green buildings are widely regarded outside the industry because they provide users with healthy and applicable functions throughout their life cycle. Generally, the interior layout of green buildings is very superior, and the use of synthetic materials is less. Instead, it focuses on the use of natural energy such as sunlight to create a good experience space for residents (An, 2012). Green buildings are based on the coordinated development of architecture, nature and occupants, making full use of innate and acquired conditions to reduce damage to the ecological environment (Zhao, 2019). After combing the relevant research literatures in China, it is found that the analysis of the game behavior of green buildings at this stage mostly stays between

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the two, that is, the government and green builders, or green builders and consumers, rarely involve the game of the three. Behavior analysis. In this regard, this paper explores the game between the government, green builders and consumers based on fuzzy numbers under the conversion of old and new kinetic energy. By exploring the game relationship, we will open up new ideas and directions for the development of green building industry.

2. Analysis of the Role Orientation of Relevant Interest Groups

2.1 Green Builder

In the overall green building industry chain, green builders bear the most important roles and missions. In essence, the green builder is the organizer and initiator of the relevant project, responsible for the implementation of the project development, actual construction and installation activities. In other words, builders integrate the development of various resources to complete the design and construction of green buildings, ensuring that green buildings can fully utilize the building functions and improve the built environment of the residents and surrounding areas (Gao, 2019). Unlike traditional building products, green buildings have significant advantages in terms of material composition and value feedback. From the perspective of the overall value chain, green builders actually undertake the connection function, and through the effective assembly of green building materials enterprises and green building service enterprises, the development and construction of green buildings is completed.

2.2 Government

In ordinary building products, the government participates in the process of building value transfer through land transfer. In the production of green building products, the government must not only carry out land transfer, but also actively participate in the project planning and design process, so as to macro-control the quality level of green buildings. Generally speaking, green buildings have obvious characteristics in terms of building materials selection and design. Therefore, the government should control the overall perspective of the urbanization process, but the green building project design meets the overall urban development needs. Moreover, in the construction phase and operation phase of green buildings, the government should formulate corresponding incentive policies in light of the local market conditions, thereby guiding the overall operational efficiency of green buildings.

2.3 Consumers

In the overall green building market, the role of consumers is also crucial. Consumers are the value realization of all production processes and represent the end of material flow. If the green building project jointly developed by the green builder and the government does not meet the needs and consumption power of consumers, it will mean the loss of project value and the fundamental purpose of coordinated development (Wang et al, 2019). Moreover, the completion of green building products is not the completion of the project, but the support of the consumer, in order to achieve material cycle and value extension. For example, green buildings have certain standards for waste. Therefore, consumers need to establish a good green development concept in order to fully utilize the environmental protection functions of green buildings.

3. Game Analysis between Government, Green Builders and Consumers Based on Fuzzy Numbers

In the green building system, the government, green builders and consumers actually constitute a loose system, which together serve the value objectives of green buildings. By combing the existing research literature, we can find five patterns of organizational conflict resolution. That is, cooperative, palliative, reconciled, mandatory, and avoidant. Different solutions will provide different interest spaces for the participating entities, thus generating different conditions of the game behavior.

3.1 Green Builders and Government

Whether green builders choose to develop and construct green building projects is closely related to project development and construction costs as well as project benefits. When green building's cost-benefit options are superior to general construction projects, green builders will launch a green building project (Liang and Qi, 2019). However, from the actual situation, the cost of green buildings is relatively high. And because the market maturity is not high, the consumer's ability to accept needs to be improved. Therefore, the project revenue of green buildings is difficult to accurately estimate. When the green builders and the government play a game, both sides make two strategic choices. Green builders' strategies are developed and not developed. The government's strategic choice is to make certain behaviors and not to make certain behaviors. That is to say, when the government's strategic choice is not to make certain behaviors, the green builder's strategic choice can be to develop green buildings, or not to develop green buildings. In this case, the conflict resolution model chosen by the government is usually cooperative and mandatory. If the government adopts a compulsory cooperation model, it can cooperate with the use of financial subsidies and tax reductions to compensate green builders to ensure the profit margin of builders.

3.2 Green Builders and Consumers

In the real estate development market, green builders are usually large real estate companies with strength and certain brand influence. As a result, green builders have a more prominent construction capability and have the combined strength to design and build green and general buildings. Without considering government intervention, the supply and demand points of green building products can be seen as a joint behavior decision between builders and consumers. For green builders, it is necessary to fully consider the supply capacity of upstream and downstream enterprises and the changes in real-time market demand before deciding whether to develop green buildings or general buildings. From the perspective of consumers, buying green buildings or general buildings requires combining their own consumption power with actual market supply to make decisions. Therefore, the green builder's strategic choice can be summarized as the development of general construction and development of green buildings. The consumer's strategic choice is also very clear, that is, buy and not buy.

3.3 Government, Green Builders and Consumers

In the process of value transfer, the government, green builders and consumers' behavioral decisions will be based on maximizing their own interests and making optimal strategic choices in line with their own circumstances. Therefore, the government, green builders and consumers will inevitably have conflicts, which will lead to game behavior. Among the three, the government pursues the maximization of social benefits, green builders pursue economic benefits, and consumers pursue architectural utility. In general, the green builder's efficiency pursuit can be achieved through the completion of the project. The pursuit of goals by the government and consumers needs to be accumulated over a certain period of time before they can be realized. In the three-way game between the government, green builders and consumers, the consumer's strategic choice is whether to buy or not, mainly because the cost of payment is consistent with the pursuit of goals.

4. Conclusion

Unlike ordinary buildings, the superior externalities of green buildings have a significant positive effect, so the value of green buildings is a mesh structure. Based on the economic value and usability value of general buildings, more social and environmental values are extended. In the process of extending the value of the whole, the government and consumers are all relevant interest groups. Therefore, a three-party game pattern of government, green builders and consumers has been formed. The three-party interest groups will make the optimal strategic choices based on their own pursuit of goals and the actual situation, thus preventing the other two parties from

compromising or cooperating. This kind of mutual game situation has a certain positive impact on the green building market, which can help the construction market to strengthen normativeness and thus achieve sustainable development of the construction industry.

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