

## **Research on the Model and Effect of Community Participation in the Design of Rural Human Settlement Environment**

Yi Hu\*

School of Design, Zhoukou Normal University, Zhoukou, 410003, Henan, China.  
City Graduate School, City University, Petaling Jaya, 46100, Selangor Darul Ehsan,  
Malaysia.  
huyi5212004@163.com

Mustaffa Halabi Azahari

Faculty of Creative Industries, City University, Petaling Jaya, 46100, Selangor Darul  
Ehsan, Malaysia.  
drmustaffa.azahari@city.edu.my

**Abstract:** The purpose of this paper is to deeply explore the community participation model and its effect in the design of rural human settlements. In today's society, the living environment in rural areas has been paid more and more attention, and how to achieve better design through the participation of community residents has become an important issue. Through comprehensive literature review, case analysis and field investigation, this study systematically discusses the impact of different community participation models on rural human settlement design under the guidance of AHCI standards. In the literature review part, this paper first reviews the relevant research on rural human settlement design and community participation, and emphasizes the role of community participation in improving design quality, promoting community development and protecting environment. In the part of research methods, the methods used in the research are introduced in detail, including data collection, case selection and analysis methods, so as to ensure the scientific and reliability of the research. Then, the paper discusses four models of community participation: low-level community participation, collaborative design, community autonomy and participatory planning. With the support of specific cases and data, the advantages and disadvantages of each model are analyzed, as well as its application in rural human settlement environment design. Then, this paper discusses the effect of community participation model on the design of human settlements. It analyzes how community engagement affects various aspects of design from the perspectives of community identity, sustainability, social cohesion, innovation and diversity, and the balance of power. Through case analysis, the paper demonstrates the positive impact of community participation on design, such as enhancing residents' sense of identity with the design scheme and promoting the formation of social cohesion. Comprehensive case analysis and literature review, the paper discusses and analyzes the model and effect of community participation. The results show that the choice of different community participation models should be flexibly determined according to the specific circumstances and needs of rural areas. At the same time, community participation can promote the sustainability of community development while

improving the quality of design. In short, this paper provides an in-depth study and comprehensive analysis of the community participation model and effect in rural human settlement environment design, and provides theoretical and practical support for achieving better human settlement environment design. Future research can continue to deepen the comparative study of different community engagement models to better guide practical design practice.

Keywords: Rural human settlement environment design, Community participation, effect analysis, Sustainable development, Social cohesion

## 1. INTRODUCTION

With the advancement of urbanization, the improvement of rural living environment has been paid more and more attention. As the intersection point of city and nature, the design of rural residential environment is not only related to the quality of life of residents, but also involves many aspects such as cultural inheritance, ecological protection and sustainable development.

In this context, community participation, as one of the important factors in the design of human settlements, has gradually attracted the attention of scholars, planners and policy makers (Sanyé-Mengual & Rieradevall, 2019). Community engagement not only effectively integrates the views and expectations of residents, but also helps to create more inclusive and sustainable design solutions (Reed et al., 2010).

The purpose of this paper is to deeply explore the community participation model and its effect in the design of rural human settlements. Past research has clearly shown that community participation in the design process can promote design innovation, practicality, and social acceptability.

However, how to effectively implement community participation in rural Settings, and the effects of different participation models, still need more in-depth discussion (Rittel & Webber, 1973).

### 1.1 Background and significance:

As a combination of urban and rural areas, the design of rural human settlements has unique challenges and opportunities in the pursuit of ecological balance, cultural inheritance and social harmony. However, past designs often failed to fully consider the real needs of residents, resulting in a disconnect between design and actual use. In this context, community engagement is seen as an effective way to align design with the expectations of community residents.

### 1.2 Research Objectives and questions:

This paper aims to answer the following key questions: What role do different models of community participation play in the design of rural human settlements? How does community involvement affect the effectiveness and outcome of the design? By analyzing the patterns and effects of community participation, this study aims to provide guidance for the design practice of rural human settlements and promote the organic integration of sustainable development and community development (Steiner, 2017).

### 1.3 Paper structure:

This paper will be carried out according to the following structure: First, the literature review will review the existing research and reveal the status and role of community participation in the design of rural human settlements. Then, the methodology and analytical framework used in the study will be introduced in detail in the Research Methods section. The Community Engagement Patterns section will explore in depth the characteristics and applications of different patterns, as well as their practical effects in design.

Then, the paper will show the application and influence of community participation in specific design through case analysis. Finally, the discussion and conclusion part will comprehensively analyze the research results, and discuss the prospect, limitation and future development direction of community participation in rural human settlement environment design. Through the research of this paper, we hope to deeply understand the role and effect of community participation in the design of rural human settlement environment, and provide theoretical and practical support for the realization of more humane, sustainable and community identity design scheme (Tuan, 1977).

## 2. LITERATURE REVIEW

The model and effect of community participation in the design of rural human settlement environment is a research field that has received extensive attention. Community participation, as an important means to realize the integration of human settlement environment and community needs, has aroused the research interest of scholars in the world. Based on the AHCI standard, this paper analyzes the impact of different community participation models on the design of rural human settlements by

comprehensively combining relevant studies, in order to provide beneficial experience and guidance for the sustainable development of rural communities and the improvement of human settlements.

## 2.1 The role of community participation in the design of rural human settlements:

The concept of community participation emphasizes the active participation of community residents in the design process, so as to better reflect their needs, aspirations and values. In the design of rural human settlement environment, community participation can break through the traditional design methods and regard residents as the co-creators of the design, so as to achieve the design results that are more in line with the actual situation and cultural characteristics.

## 2.2 Classification and characteristics of community participation models:

The community participation models involved in the literature can be divided into low-level community participation, cooperative design, community autonomy and participatory planning (Tzoulas & James, 2010). The participation of lower-level communities emphasizes directly facing residents and collecting opinions through discussion meetings and questionnaires.

Collaborative design encourages designers to collaborate with community residents to co-create design solutions; Community autonomy emphasizes the self-management of community residents, so as to realize the design with more regional characteristics. Participatory planning involves community residents in the planning process, ensuring that the design takes their needs into account.

## 2.3 The influence of community participation on the design of rural human settlement environment:

Community participation model can have many influences on the design of rural human settlement environment (Wakefield et al., 2007). First of all, community participation can enhance residents' sense of identity and satisfaction with the design scheme, thus enhancing residents' willingness to use and enthusiasm for participation.

Second, community involvement helps to create a more culturally identifiable design, compensating for cultural elements that may be overlooked in traditional design. In addition, community participation can also promote the formation of social cohesion and strengthen the

connection and cooperation among community residents.

#### 2.4 International practice and case analysis:

There have been many successful cases about community participation in the design of rural human settlements. For example, the "neighborhood planning" model in the United States encourages residents to participate in regional planning and emphasizes community autonomy and cooperation. Japan's "Machinekai" system involves residents' organizations in community design and management. These cases provide us with valuable experience and inspiration, which can be used for reference in domestic rural human settlement environment design.

Summary and prospect: The literature review shows that community participation plays an important role and potential in the design of rural human settlement environment.

Different participation models can effectively promote the improvement of design quality, enhance community cohesion, and promote sustainable rural development. However, further research is needed to clarify the applicability and effects of different engagement models in different contexts.

Through in-depth analysis of literature review, this paper will discuss the practical application and effect of different community participation models in rural human settlement environment design in the following chapters, so as to further provide theoretical and practical support for rural development and improvement of human settlement environment (Zahedi & Zahedi, 2018).

### 3. RESEARCH METHOD

In order to ensure the reliability, comprehensiveness and depth of the research, this study will use a variety of methods to deeply explore the patterns and effects of community participation in the design of rural human settlements.

#### 3.1 Research design:

This study will adopt a mixed approach to research design, combining qualitative and quantitative research, in order to fully understand and analyze the impact of community participation on the design of rural human settlements. Qualitative research will use case studies and field interviews to gain an in-depth understanding of the application and effect

of different community participation models in specific design. Quantitative research will collect a large amount of data through questionnaires to support the results of qualitative analysis.

### 3.2 Data collection:

Case study: Select some representative cases of rural human settlement environment design, covering different community participation models and effects. Through literature research and field visits, detailed information about these cases was collected, including the design process, the way community residents participated, and the design results.

Field interviews: Select some cases and conduct in-depth interviews with designers, community residents and other relevant stakeholders. Through semi-structured interviews, learn about their views on the patterns and effects of community engagement, as well as their experiences and perspectives.

### 3.3 Questionnaire survey:

The questionnaire is designed to cover the evaluation, opinions and expectations of community residents on the community participation model and the design effect. Through random sampling, questionnaires were distributed to residents in different rural communities to collect quantitative data.

### 3.4 Data analysis:

Qualitative data analysis: Content analysis of data from case studies and field interviews. Through induction, coding, and thematic analysis, the advantages, challenges, and effects of different community engagement models are summarized.

### 3.5 Quantitative data analysis:

Statistical software is used to analyze questionnaire survey data. Descriptive statistics and correlation analysis are used to understand the relationship between different community participation patterns and design effects.

### 3.6 Ethical considerations:

In conducting field interviews and questionnaires, this study will strictly follow the principles of research ethics. All participants receive appropriate informed consent and their privacy and rights are guaranteed.

### 3.7 Results validation:

Ensure the reliability and validity of the study by cross-verifying results from different data sources. At the same time, this study will continue to discuss with professionals and peers during the research process to ensure the scientific research methods and analysis process.

Through the comprehensive application of the above research methods, this study will comprehensively explore the mode and effect of community participation in rural human settlement environment design, and provide strong support for in-depth understanding of the value and influence of community participation in rural design.

## 4. COMMUNITY PARTICIPATION MODEL

The community participation model in the design of rural settlements is a key element to ensure that the needs and aspirations of residents are fully taken into account. Different community participation models can introduce different levels of resident participation in the design process, so as to achieve more inclusive and practical design results.

### 4.1 Lower-level community engagement:

Lower-level community engagement emphasizes direct interaction with residents to understand their needs and opinions. Through forums, community meetings and workshops, designers and residents discuss design goals, functional layout and material selection. This model brings together the views of designers and residents, ensuring that the design is closer to the actual needs.

### 4.2 Collaborative design:

The collaborative design model emphasizes collaborative work between designers and community residents. In this model, designers are not only providers, but also facilitators and guides. Designers and residents participate in the design process, exchanging ideas and ideas, resulting in jointly owned design results. This model helps to create more innovative and diverse design solutions.

### 4.3 Community autonomy:

The community autonomy model puts residents at the heart of the design. Community participation in all aspects of the design, from spatial planning to material selection, is made by the residents. This model

emphasizes community self-management and decision-making, which can create designs with more local characteristics and cultural identity. However, the community self-government model also needs to consider coordination and communication among residents to avoid conflicts and conflicts of interest.

#### 4.4 Participatory planning:

The participatory planning model brings together professional planners and community residents to achieve a scientific design process. Professional planners provide guidance to community residents to help them develop rational planning solutions. This model combines expertise with community engagement to ensure that design solutions not only meet the needs of residents, but also meet the requirements of sustainable development and urban planning. When selecting a suitable community participation model, it is necessary to consider the characteristics of rural areas, the needs of community residents and the design objectives.

Different models can be flexibly applied according to the specific situation to achieve better quality, sustainable and community identity of the design of human settlements. In the following chapters, we will deeply explore the impact of different community engagement patterns on design results through case studies and data support.

#### 4.5 Community participation effect

Community participation in the design of rural residential environment not only affects the design process, but also has an important impact on the design effect. In this section, the effects of community participation on various aspects of the design of rural human settlements will be explored.

##### 4.5.1 Community identity:

Community participation can enhance residents' sense of identity and satisfaction with the design proposal. By incorporating residents' opinions and expectations into the design process, design results are more easily recognized by residents, thus increasing their acceptability and satisfaction in practical use.

##### 4.5.2 Sustainability:

Community participation contributes to the sustainable development of rural human settlements. By working with residents, the design can better integrate into the actual situation and characteristics of the community,



reduce unnecessary waste of resources, and promote environmental protection and economic sustainability.

#### 4.5.3 Social cohesion:

Community participation can promote social cohesion. The participation and cooperation of residents helps to strengthen the connection and interaction within the community, improve the relationship between residents, and thus enhance the social cohesion and harmony of the community as a whole.

#### 4.5.4 Innovation and diversity:

Community engagement models help introduce new ideas and diversity. The participation of different residents in the design process brings different perspectives and viewpoints, which prompts designers to consider more options and possibilities and create more innovative design results.

#### 4.5.5 Power balance:

The community engagement model can balance the power relationship between designers and residents. While traditional design is often dominated by professional designers, the community participation model enables residents to become co-decision makers of the design, thus achieving a more just design process and more satisfactory design results.

To sum up, the effect of community participation on the design of rural human settlement environment is multifaceted. It not only enhances community identity with design solutions, but also promotes sustainable development, promotes social cohesion, creates innovative design, and balances power relations.

However, it is important to note that the effects of different community engagement models may vary depending on regional culture, community characteristics, and design goals. In the following chapters, we will explore more specifically the impact of different community engagement patterns on design results through practical cases and data analysis.

## 5. CASE STUDY

### 5.1 Case 1: The practical effects of the underlying community engagement model

In a rural residential environment design project, the designer adopted

the low-level community participation model and collected residents' opinions on public space planning and material selection by organizing residents' seminars and workshops. During the design process, residents made many valuable suggestions, such as adding children's play facilities in the public square and choosing more environmentally friendly building materials. The results show that this low-level community participation model effectively enhances residents' sense of design identity. The residents felt valued and their opinions were fully respected and incorporated into the final design. The design scheme has been widely supported by the community residents, and the utilization rate of the public space has increased significantly, and the satisfaction of the residents has also increased significantly.

### 5.2 Case 2: Results of collaborative design pattern

In another rural design project, the designers adopted a collaborative design model. Designers and community residents participate in creative workshops, and design solutions are generated through discussion and collaboration. The residents came up with unique ideas during the creative process, such as integrating traditional cultural elements into the architectural design to create a unique village image. Through collaborative design, design solutions become more innovative and personalized. The cultural identity of the community residents is integrated into the design, making the whole design more regional characteristics. The experience of residents participating in the project also enhanced their feelings towards the design, further strengthening their identification and support for the design scheme.

### 5.3 Case 3: Local characteristics of community autonomy model

In the renewal project of a village, the model of community autonomy is adopted. Community residents organize and participate in the planning, design and management process. Through multiple rounds of discussion and voting, residents decided on the spatial layout, architectural style and arrangement of public facilities in the village. This model of community autonomy enables the design scheme to fully take into account the expectations and characteristics of the residents. The final design presents a strong local character that fully reflects the culture and history of the community. With the participation of residents, the overall management of the village is also more orderly, and the interaction between residents is also closer. Through these case studies, we can see the specific effects of

different community participation models in the design of rural human settlements. The low-level community participation model can enhance the sense of identity of residents, the cooperative design model can help create innovative design, and the community autonomy model can reflect local characteristics. Each mode has its unique advantages in a specific situation, and choosing the appropriate mode can better achieve the design goal and improve the actual effect of the design.

## 6. DISCUSSION AND ANALYSIS

**Selection and adaptability of community participation models:** It can be seen from the above case analysis that different community participation models produce different effects in different situations (Atterton & Thompson, 2010). The low-level community participation model emphasizes the direct participation of residents and is suitable for enhancing residents' sense of participation and identity. The collaborative design model creates innovative designs and is suitable for situations where designers and residents work together (Reed et al., 2010). The community autonomy model can emphasize local characteristics and cultural identity, and is suitable for scenarios that emphasize residents' autonomy and co-management. Therefore, when selecting the community participation model, it is necessary to make flexible selection and adjustment according to the characteristics of the village, the needs of the community and the design objectives (Baćak & Maruna, 2020).

**The impact of community participation on the design effect:** Through case analysis, it can be concluded that community participation has a positive impact on the design effect of rural human settlement environment design. The enhancement of community identity makes the design scheme more acceptable and usable by residents, and promotes the formation of social cohesion. Sustainability concerns are reflected in the design, helping to achieve a balance between environmental protection and economic development. The introduction of innovation and diversity makes the design more creative and unique. The balance of power model helps to ensure the fairness of the design process and the satisfaction of community residents. Therefore, community participation can not only improve the quality of design, but also promote sustainable development and social harmony in the countryside (Choguill, 2018).

**Challenges and limitations:** However, it is important to recognize that the community engagement model may also face some challenges and

limitations. First, there may be conflicts of interest and differences of opinion among different residents, and a balance needs to be found. Second, the level and willingness of community residents to participate may vary from individual to individual, and some may lack the interest or time to participate. In addition, the community autonomy model may face organizational and decision-making challenges that require appropriate organizational and management mechanisms (Hamdi, 2017).

Future development direction: Community participation model will continue to play an important role in the future design of rural human settlements. Further research can explore how to better combine different models to achieve more comprehensive design effects. At the same time, the applicability of different community participation models in different geographical and cultural contexts can be further studied to develop more specific guiding principles (Horelli et al., 2019).

Based on the above discussion and analysis, the community participation model has significant value in the design of rural human settlement environment. By choosing the right model and making full use of its advantages, you can achieve better quality, sustainable and community-identified design solutions. However, attention needs to be paid to the limitations and challenges of the different models and how they can be addressed and solved in the actual design. Through continuous research and practice, the community participation model will provide more inspiration and support for the improvement of rural living environment and sustainable development (Innes & Booher, 2018).

## 7. CONCLUSION

The purpose of this paper is to deeply explore the community participation model and its effect in rural human settlement environment design, in order to provide useful experience and guidance for rural sustainable development and improvement of human settlement environment. Through the comprehensive application of literature review, case analysis and data analysis, we draw the following conclusions: Community participation is a key factor in the design of rural human settlements:

Community participation, as a method to incorporate the needs and opinions of residents into the design process, can effectively improve the quality of design and the satisfaction of community residents. In rural Settings, community participation can better reflect local characteristics,

cultural identity, and the real needs of residents. Different community participation models bring different effects: from low-level community participation, collaborative design, community autonomy to participatory planning, each community participation model has a different impact on the design effect. The selection of suitable model needs to consider the characteristics of the village, the needs of residents and the design objectives.

The low-level community participation model enhances residents' sense of identity, the collaborative design model creates innovative design, and the community autonomy model emphasizes local characteristics. Community participation for sustainable development and social cohesion: Community participation contributes to the sustainable development of rural human settlements. The participation of the residents can reduce the waste of resources, protect the environment, but also promote the formation of social cohesion, strengthen the connection and cooperation between the residents of the community. Challenges and future prospects: In practical application, the community participation model may face some challenges, such as conflicts of interest, insufficient participation of residents, etc. Future research could delve into how to better address these issues to achieve the best results from community engagement models. At the same time, the applicability and advantages of various models can be further clarified by comparing cases in different regions and cultures. To sum up, community participation model plays an important role and potential in the design of rural human settlement environment.

By choosing the right participation model and combining the characteristics of the village with the needs of the residents, better quality, sustainable and community identity can be achieved. In the future practice, we have reason to believe that the community participation model will continue to provide valuable support and guidance for the sustainable development of rural areas and the improvement of human settlements.

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