

Survey on Residents' Willingness to Participate in Sponge Transformation and Construction of Old Residential Areas in Anhui Province

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Abstract: The sponge transformation of old residential areas is one of the keys to the popularization of sponge city construction. The investigation of residents' willingness to participate in the sponge transformation of old residential areas in Anhui Province can not only promote the sponge city construction in Anhui Province, but also provide a reference for the sponge city construction in the whole country and improve the construction efficiency. Based on the participatory theory, the residents in the old residential areas were selected as the research objects, and the residents' willingness to participate in sponge city reconstruction was investigated through questionnaires, and the sponge city reconstruction policy was popularized. To explore the willingness of residents to participate in the sponge city reconstruction of old residential areas, so as to provide ideas and countermeasures for the construction of new urbanization and accelerate the progress of new urbanization.

Keywords: Sponge city, Residents' willingness to participate, Old residential area, In Anhui province.

1. Research Background and Literature Review

1.1. Research Background

With the acceleration of urbanization in China, urban water pollution, water shortage and other problems have emerged one after another, and urban rainstorm also occurs from time to time. Upholding the concept of green and sustainable development, China has promoted the construction of sponge cities. So far, there have been several pilot projects and 45 sponge cities have been approved. The sponge transformation of old residential areas has become one of the difficult problems in the popularization of sponge city construction in China. The willingness of residents to sponge transformation will affect the enthusiasm of residents to participate in the reconstruction of residential areas and the smooth degree of the reconstruction. Based on the concept of sponge city, the sponge transformation of old residential areas refers to the transformation activities of using low-impact development technology to promote the natural infiltration, storage and purification of rainwater in old residential areas, so as to achieve the goal of effective utilization of rainwater resources and improvement of the city's ability to resist rain and flood. Based on the participatory theory, this study collected residents' willingness to participate in the sponge construction of old communities in Anhui Province through questionnaires, and quantified the influence of various factors on residents' willingness, in order to accumulate experience and promote the construction of sponge cities in China.

1.2. Literature Review

The international research on urban rainfall runoff control started earlier, and before the sponge city construction concept was put forward in China, the existing international theoretical system mainly includes the low-impact development in the United States, the sustainable drainage system in the United Kingdom, and the watersensitive urban design in Australia. At present, there are not many researches on residents' opinions on the sponge transformation of old

residential areas in China. Residents are unable to participate, have no road to participate, and have no intention to participate.

In terms of participation behavior, Hua Mu-yang et al. defined the participation behavior pattern of residents in the sponge reconstruction of old residential areas by studying the mechanism of residents' participation in the sponge reconstruction of old residential areas, and analyzed the internal mechanism of residents' different behavior decisions in the sponge reconstruction of old residential areas from the perspective of behavioral psychology. The mechanism of residents' participation was verified by empirical method and residents' participation strategies were proposed according to the results. It was proved that behavioral attitudes, subjective norms and perceived behavioral control had significant effects on residents' willingness to participate and their choice of participating behaviors.

In terms of influencing factors of participation, Gu Tian-tian et al. comprehensively used qualitative and quantitative research methods to systematically analyze the resident participation governance mode, resident participation governance level, resident participation governance formation mechanism and resident participation governance dynamic simulation of the old residential area sponge transformation. Analyzed from the aspects of internal and external two old village transformation of sponge residents to participate in governance mechanism, the results of sensitivity analysis, from strengthening propaganda, build atmosphere and improve the system of participation, establish confidence and strengthen the construction of community residents put forward five aspects, such as the sponge of older communities residents to participate in the management level of countermeasures.

In risks, such as raivy perspective to the whole life cycle risk identification and analysis, based on the Vensim software, risk evolution model was established for environmental policy, ideology, economic management and engineering technology module of risk factors for sensitivity analysis, sensitivity to four types of construction schedule,

construction funds, and the highest factors which impact analysis of the engineering quality. By changing the value of risk factors, different risk evolution simulation schemes were developed and analyzed, and it was found that public opinion risk had the highest comprehensive impact. The risk response strategy was proposed, and the risk evolution simulation model of the old residential sponge reconstruction project was constructed by using the system dynamics method.

In summary, Chinese researchers have made fruitful achievements in the details of residents' participation in the sponge transformation of old residential areas, but there are few data analyses on the combination of theory and actual residents' willingness. In view of this, the team used the actual survey data, combined with theoretical knowledge and four analysis methods, to study the residents' willingness to participate in the sponge transformation of the old residential areas.

2. Participatory Governance Theory

Participatory governance is a new governance model. It is a process in which individual citizens, organizations and governments who have an interest in policies participate in public decision making, allocate resources and cooperate in governance. Sponge reform from residents to participate in the management of older communities is the community residents in line with the individual needs and public spirit, to participate in the governance model through a certain process involved in the sponge of older communities, including sponge of older communities decision-making, implementation and operation and maintenance, which

affects the government department in the old village of sponge on the decision-making and implementation, To realize the cooperative governance between the government and residents on the sponge transformation of old residential areas. Residents participate in the governance and use their collective wisdom to solve problems together, making the neighbors more harmonious and friendly; The participation of residents in community management can improve the efficiency of community work, improve the organization ability, and better serve the residents.

3. Investigation Status and Data Analysis

3.1. The Basic Situation of The Investigation

In order to study the residents' willingness to participate in the sponge transformation of old residential areas in Anhui Province, the team adopted the methods of literature survey, questionnaire survey, quantitative analysis and comparative analysis. The survey population was the residents of the old residential areas that will be transformed or have been transformed in Anhui Province. It mainly focused on the residents' understanding of sponge transformation, the system and norms of the old residential areas, the residents' willingness to participate in the sponge transformation of the old residential areas, the reasons and the residents' suggestions. A total of 200 questionnaires were released and 144 valid questionnaires were collected.

Table 1. List of sample age distribution

Age range	Less than 20 years old	20 to 34 years old	35 to 49 years	50 to 64 years old	Age 65 and older
The number of	61	26	23	18	16
The proportion	42.36%	18.06%	15.97%	12.5%	11.11%

Table 2. List of residents' understanding of sponging in older neighborhoods

Understanding of sponging in older neighborhoods	Not at all	A little understanding	To understand	Understand better	Know well
The number of	37	54	21	23	9
The proportion	25.69%	37.50%	14.58%	15.97%	6.25%

The respondents under 34 years old accounted for 60.42%, while those over 35 years old accounted for 39.58%. It can be seen that young residents were more active in the survey (Table 1). Secondly, residents' understanding of sponging in old residential areas is not high, accounting for 63.19% (Table 2). The research shows that residents do not have a clear understanding of sponging. Both internal reasons such as age, income and education level and external reasons such as publicity and education, community management and reward system have an important impact on residents' willingness.

3.2. Data Collection

Data showed that 60.42% of the residents did not

understand the essence of the sponge transformation released by the community, and there was a lack of unified publicity department; If the relevant departments provided channels, 87.50% of the residents would be willing to participate in the sponge transformation of the old residential areas, but at present, 26.39% of the residents said that their communities and departments did not provide channels and did not release information about the sponge transformation.47.92% of the residents are satisfied with the greening, environment and the use of public space in the old residential area.(Figure 1, Figure 2, Figure 3)

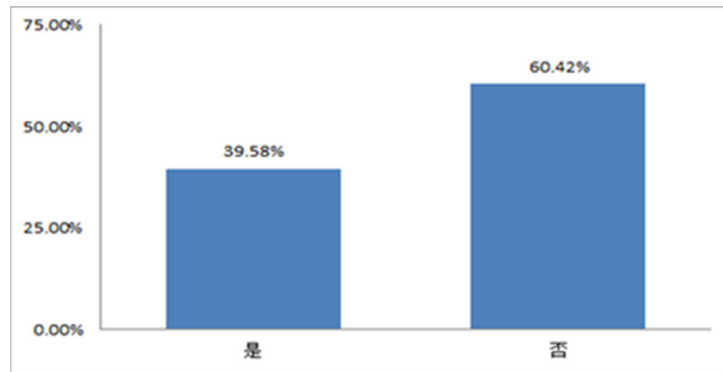


Figure 1. The situation of the community releasing the information of the sponge transformation of the old residential area

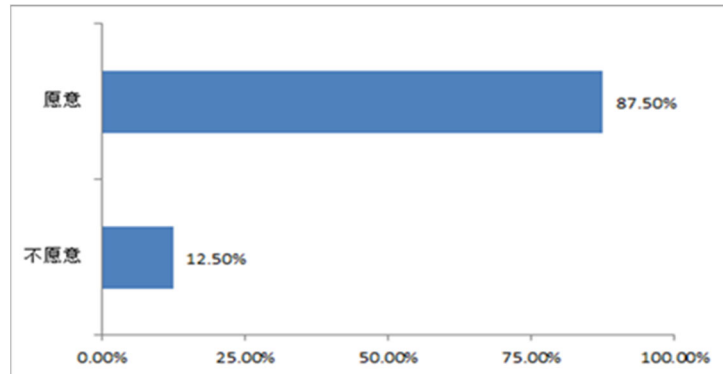


Figure 2. Residents' willingness to participate in the renovation of old residential areas

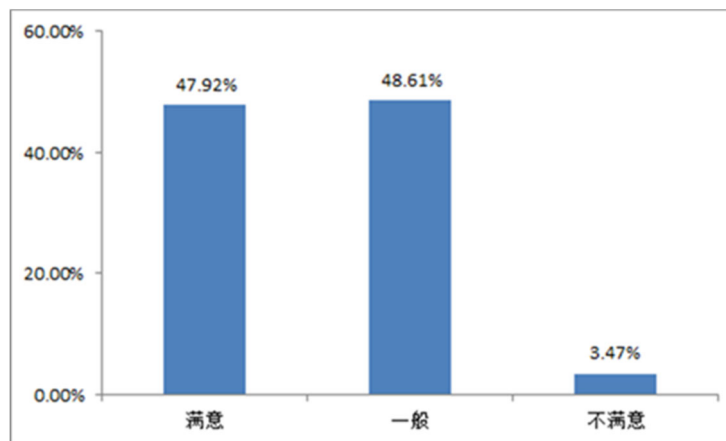


Figure 3. Residents' satisfaction with the community environment

3.3. Theoretical Analysis

Residents' participation is an inherent and indivisible feature of community governance, and the core of participatory governance is to involve residents. City reconstruction project of systemic problems, sponge interlocking system coordination and cooperation of a part of any errors will affect the residents to participate, the residents themselves to improve the recognition of at the same time, other relevant personnel and departments should actively cooperate with, even after the renovation should be actively on the investigation of residents and encourage the participation of residents to pay. Through the analysis to the research result shows the vast majority of residents on the sponge reformed with positive attitude and willing to voluntary participation and learning related projects, residents themselves to participate is higher, but the government and the community staff dispersing pertains not positive enough, there are still some measures about work in general, related departments should actively respond to residents to

participate in, To promote the process of building a resilient city.

4. Dilemma Analysis of Public Participation Willingness in Sponge City Construction

When analyzing the factor of residents' participation, we will combine engineering and non-engineering aspects to analyze it. In the process of construction and transformation, the construction party, supervision party, residents and other personnel are involved. Considering that the sponge transformation of the old residential area involves the maintenance and repair of water storage, drainage network, road, housing and other facilities, which has a great impact on the daily life of residents.

4.1. Engineering Aspects

During the renovation project, some facilities (such as roads, water storage facilities, water pipe network) and other

water supply and drainage facilities, residents' underground garages, private courtyards and other residents' personal property Spaces may also be included in the scope of the construction object of the renovation project. The problem of sponge transformation of old residential areas is closely related to people's life. Anhui Province is a developed water system in China, so it is of great practical significance for

residents' life to carry out sponge transformation of residential areas with old facilities.

During the construction of the old residential area, the life of residents will be affected to a certain extent. The survey data show that 89.58% of the residents accept the impact and are willing to cooperate with the staff (Figure 4).

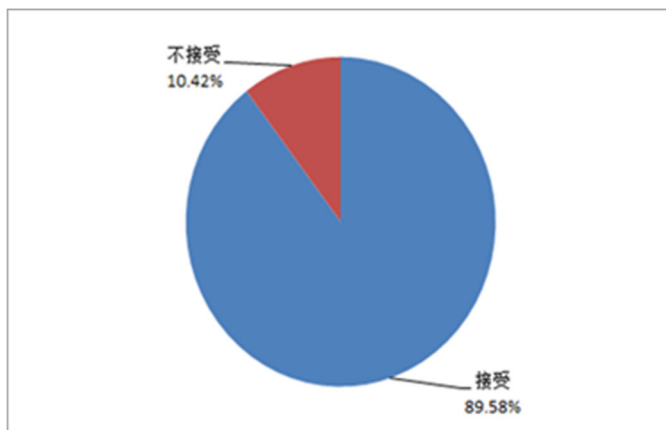


Figure 4. The extent to which residents are willing to accept the impact of the reconstruction

4.2. Non-engineering Aspects

4.2.1. The Level of Social and Economic Development and The Intervention of Social Forces

Social and economic factors are also important factors that we need to consider. When carrying out project planning, project fund is the most important link, involving financing, fund supervision, follow-up fund operation and other complex matters. In work related to insufficient transparency, residents unable to exercise effective supervision over the operation management of project funds, could lead to if project engineering problems encountered in engineering, for his lack of confidence, in turn, questioned, and even protest, residents and project engineering party conflict with regulators, adverse effects on the construction work.

Generally speaking, the sponge transformation of old residential areas is initiated and planned by the government, and the financing is led by the government and the main source of funds is government financial expenditure. The construction unit is responsible for the actual construction and transformation, so the government is at the core of the project work. Government in the planning, a need to review some old memory cell meets the need of the standards of the reform of the sponge, whether government departments have enough open and transparent public opinion collection and feedback channels to be turned village residents to have a clear understanding of project, rather than being trapped in the cocoon of information.

4.2.2. Residents' Cognition of The Spongy Transformation of The Residential Area

With the development of urbanization in our country, the urban population grows year by year, and the urban water use question has been paid more and more attention by people. In order to solve the problems of urban water shortage, water pollution, urban waterlogging and so on, the sponge city concept is put forward in China, and the urban pilot is established to lay the foundation for the popularization of sponge city construction. The sponge city transformation of old residential areas is the demand of urban environmental protection. It is understood that the sponge city

transformation is beneficial to the life of residents. According to the survey, most residents do not have a thorough understanding of the concept of sponge city, that is, a low awareness, and lack of detailed understanding of channels. As the main participants in the construction of residential sponge city reconstruction, residents' cognitive deficiency in the reconstruction is also one of the important reasons affecting the sponge city.

5. Conclusions and Suggestions

5.1. Establish A Management Mechanism for Residents' Participation and Feedback

At the present stage, residents do not have a strong sense of participation in the sponge transformation project of the old residential area. By means of literature analysis and field interviews, we can have an in-depth understanding of the various problems encountered by residents in their lives and the future direction of the transformation of the residential area. To summarize the reasons why residents are not willing to participate in the project, we can classify the residents' age and economic status in combination with online anonymous survey, which is conducive to the future transformation of the community. Establish a complete set of feedback management mechanism, establish some standards in each independent link, formulate feasible plans and implement the responsibility of inspection work. The task of each link should be combined with the feedback and suggestions of residents, so as to timely cope with the problems that residents do not want to cooperate in the process of reconstruction.

5.2. Maintain the Infrastructure Well

In the process of sponge transformation, in addition to integrating technology into construction, attention should also be paid to infrastructure. As for the infrastructure, it can be inspected regularly to make the equipment use stably for a long time. Provide regular professional training for employees to improve their professionalism. Attention should not only be paid to the facilities inside the community, but also to improve the ability of the town or urban and rural

system in which the transformation community is located to withstand the impact of heavy rain and flood discharge ability. The two can be regarded as a harmonious whole, and the construction should be in order. If the capacity of the local drainage system is neglected in the reconstruction community, the final reconstruction effect of the community will not be very good.

5.3. Promote Low-impact Development

In the process of promoting the sponge transformation of the residential area, the intensity and progress of development should be well grasped to prevent the destruction of the original environment of the residential area in the process of development. Reduce the impact of traditional construction on the environment of the community, improve the community in all aspects of the function, improve the community to withstand the flood disaster ability. In terms of construction, roof greening and constructed wetlands can be used to promote the accumulation and purification of rainwater. Through various measures, the drainage capacity of the community can be enhanced as far as possible to reduce the impact of heavy rain on the community. Through some mild ways, in the process of promoting the sponge transformation of the old residential area, the impact on the ecological environment can be minimized.

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