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Renewal Needs and Solutions for Urban Old Communities under the Guidance of Resilient Security

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Abstract The renewal strategy guided by resilient security aims to enhance the community's resistance and resilience to natural disasters and other emergency situations, ensuring that the community can quickly restore normal functions in the face of shocks. By enhancing the resilience of the community, residents' sense of security and satisfaction can be improved, while promoting the long-term stability and prosperity of the city. Using methods such as literature review, case analysis, and demand investigation, this paper investigates the needs and strategies for the renewal of urban old communities, and explores the demand analysis and solutions for the renewal of urban old communities under the guidance of resilient security. This paper aims to address the lack of resilience in old communities caused by outdated construction, aging infrastructure, and insufficient public services, as well as how to improve the adaptability, resilience, and transformation ability of communities through renovation and transformation.

Keywords Resilient security, Old community, Community renewal, Demand analysis, Implementation path
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1 Concept and location characteristics of urban old communities

Urban old communities usually refer to residential areas that have been built for 20 years, with outdated public facilities which affect residents' basic lives, and a strong desire for renovation.

The evaluation of the characteristics of old residential communities in Beijing shows that they account for over 40% of the existing residential communities in terms of quantity, mainly distributed between the Second and Fourth Ring Roads, with the highest number in Xicheng District, followed by Haidian District, Dongcheng District, and Chaoyang District. The construction period is mostly from 1976 to 1990, and the old communities are mostly multi-story residential buildings with 4-6 floors, with a serious lack of property management services. The residents of old residential areas generally have good geographical locations and relatively superior accessibility to public services, but the material environment is difficult to keep up with in the development process.

In addition, urban old communities also exhibit the "dual aging" characteristics of aging population and aging infrastructure, facing many problems in community governance such as heavy construction tasks and limited governance resources.

2 Current situation research and analysis

Resilient security typically refers to the state in which a system, community, or city is able to maintain functionality, quickly recover, and learn from various shocks and pressures to enhance its own capabilities. It emphasizes that the system should have adaptability, resilience, and transformation capabilities in an environment of uncertainty and change.

Resilient safe city refers to the ability of a city to effectively prevent and resist various major shocks, quickly restore its "functions" from shocks, maintain the normal operation of its core functions, and improve the overall level of urban safety through learning and innovation in response to shocks.

2.1 Relationship between resilient security and renewal of old communities

As an important component of the city, the renewal and renovation of old communities are of great significance in enhancing the resilient safety of the entire city. Due to the early construction of old communities, there are usually problems such as aging infrastructure and insufficient public services. These issues may amplify the vulnerability of communities in the face of natural disasters or socio-economic changes, posing higher safety risks to older communities. Therefore, it can not only improve residents' quality of life and ensure the safety of their lives and property, but also enhance the community's ability to prevent and reduce disasters by enhancing community resilience through renovation and upgrading.

2.2 Research results and analysis

Lei Ziyue[1] proposes that a resilient community system should have the ability to quickly adapt to changes in the external environment; can effectively integrate human, material, and financial resources to enhance the self-protection ability of the community; have flexible community system planning and decision-making ability to make flexible adjustments according to different situations; have public collaboration ability, and community members can actively participate in community affairs and decision-making; have the ability for sustainable development, to build community environmental spaces, and enhance the community's ability to absorb natural disasters; have the ability to adapt to intelligent devices, and the construction of resilient communities can enhance the community's self-adaptability through the use of new technological devices, digital technology, and intelligent solutions. In this paper, the capabilities that resilient communities should possess are analyzed. It is obtained that resilient communities should have complete and regularly maintained infrastructure, safe and regularly inspected building structures, public service facilities that meet residents' needs, community governance led by party building and resident participation, a green, healthy, and humanistic environment and ecology, economy that can permanently and sustainably maintain the community, community cohesion that residents trust each other and relationships among all parties is stable, regular and targeted emergency preparedness and planning, professional and comprehensive safety risk assessment, and an up-to-date level of

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intelligence and informatization.

Based on the above conclusion, research on the surrounding old residential areas is conducted, and it is found that with the rapid development of the economy and the iterative updating of science and technology, the application materials, technology, road planning, and other aspects of old residential areas have fallen behind. The surveyed old residential areas generally face the following problems:

The incomplete supporting facilities (Fig.1), serious space occupation (Fig.2), blocked roads (Fig.3), and low level of intelligence directly affect the quality of life of residents, community harmony, and the construction of a beautiful urban image.

At the same time, there is a large elderly population in the community, and a resilience perspective not only helps improve the quality of life of elderly residents, but also contributes to the overall sustainable development of the community. Looking ahead to the future, further strengthening research and practice, and promoting the aging friendly renovation of old residential areas will be the key to enhancing urban resilience and residents' happiness. Only through continuous innovation and optimization of renovation strategies can it ensure the revitalization of old residential areas and truly achieve the dual goals of aging adaptability and resilience[2].

3 Existing issues of resilient security in old communities

In terms of the composition and age ratio of the resident population, the proportion of elderly population in old residential areas is relatively high. With the advancement of urbanization, resources such as healthcare, education, and high-quality companies are mainly concentrated in the main urban areas. Young people tend to choose to settle in main urban areas with better resources, making many old communities become gathering places for the elderly. With the intensification of urbanization and population aging, the proportion of elderly population in old communities continues to increase.

3.1 High mobility of young population

Due to the fact that many old communities were built before 2000 and the planning theory is not yet mature, the living conditions and infrastructure in old communities are not as good as those in new communities. Young people may choose to move out, resulting in a high mobility of young population in the community.

Indeed, housing rent is relatively low and transportation is convenient in old residential areas. Migrant workers and college students who have just entered society often choose to rent in old residential areas. However, due to reasons such as "pursuing better work resources", "better community environment", and "changes in work location", these tenants will choose to move out after living there for a period of time.

3.2 Significant differences in economic conditions

Economic resilience is the ability of a community to gradually recover its economic development after experiencing major public crisis events, and is one of the inherent attributes of the community. It includes four secondary indices: residents' income level, occupation type, income channel, and community special fund investment[3]. There may be significant differences in the economic status of residents within the community. Some residents with better economic conditions may have already moved out, while those with poorer economic conditions may stay in the community. At the same time, the income channels within the community are relatively single, and the community special funds are difficult to support the comprehensive resilience renewal of the community.

3.3 Increased demand for community services

With the increase of the elderly population, the demand for elderly care services in some old communities is growing day by day. At the same time, due to the distribution of educational resources in the surrounding area, the demand for early childhood care among residents of some old residential areas near schools is also increasing. However, due to premature planning and delayed community renewal, there is a lack of resources to meet the community service needs of residents.

3.4 Increased dependence on commu–nity facilities and services

There is a serious problem of aging in old residential areas. As elderly residents grow older, their dependence on convenient facilities such as elevators and accessible pathways within the community increases. At the beginning of the design of old residential areas, there was a lack of consideration for "aging friendly" devices and no reserved space for renovation, which increased the difficulty of community resilience renovation.

3.5 Community involvement and sense of belonging

Residents in old communities may have a strong sense of belonging to the community, especially those who have lived there for a long time. However, due to the high mobility of the young population, the dense population within the community, and the wide age range of residents with different needs, the participation of the floating population in community affairs is low, and it is difficult to meet the needs of all resident young people, elderly people, and adolescents. The difficulty in meeting needs indirectly leads to a lower sense of community belonging.

Fig.1 Lack of supporting fire–fighting facilities

Fig.2 Occupying public activity space

Fig.3 Private cars occupying roads

3.6 Blocked and not smooth secondary roads

Except the main traffic flow, some secondary roads are close to residential buildings. Due to the shortage of parking spaces and the lack of unified waste disposal points, residential vehicles, miscellaneous items, etc. could occupy some secondary roads, causing road congestion problems.

3.7 Poor layout of internal courtyard space

Due to the imbalance of internal space allocation, the old community has strong enclosure and cannot meet the current needs of residents. Due to insufficient space demand, vehicles are placed in disorder, and there is an increase in illegal private buildings, which has led to an increase in the scale of community renovation and difficulty in negotiating with residents.

3.8 Some houses having safety hazards

Old communities have problems such as a lack of earthquake prevention and fire protection facilities, aging, etc. Elderly residential houses often cannot regularly check for safety hazards, which cannot guarantee the safety of residents' lives.

3.9 Infrastructure urgently needing to be upgraded

Old communities often face the problem of aging infrastructure, such as water supply, power supply, drainage systems, etc. The equipment is aging and lacks regular professional inspections, making it difficult to ensure the safety and efficient operation of the infrastructure.

3.10 Living environment needing im–provement

Old residential areas have limited greenery, making it difficult to maintain them regularly. The nighttime illumination in the community is low, and some communities even have unlit road sections. The lack of cultural and spiritual promotion within the community has led to a low overall vitality among residents. It should improve the quality of the living environment, including greening, lighting, culture, and other aspects, to enhance the quality of life for residents.

3.11 Public service facilities unable to meet the needs of residents

It should increase or improve public service facilities such as education, healthcare, elderly care, and culture, to meet the diverse service needs of residents.

3.12 Community governance capacity needing to be improved

Residents are the masters of the community, and community administrative departments need to pay attention to their opinions, placing them in the position of the main participants in community renovation, and implementing targeted renovation actions. The administrative department needs to weigh the interests and needs of all parties and implement the renovation plan after integration. Community governance should be strengthened, including safety management, environmental maintenance, and resident participation, to enhance the community's ability to self manage and respond to emergencies.

4 Renewal strategies for old communities under the guidance of resilient security

4.1 Clearing renewal principles and objectives

Renewal principles: tailored to local conditions, people-oriented, resident participation, environment friendly, economically feasible. Renewal objectives: old residential areas have a wide distribution range, with different regional cultures, policy requirements, community status, and resilience levels. When customizing renewal objectives, full consideration should be given to the cultural characteristics, development stages, and policy directions of each region. The focus of the renovation of old residential areas should be determined to enhance resilient safety. At the same time, specific analysis of various factors and needs should be conducted to carry out targeted renovation.

4.2 Resilient security assessment of community

The resilient security assessment of old residential areas is a comprehensive analysis process that involves evaluating the community's ability to respond, recover, and sustain development in the face of various sustained pressures or sudden disasters. Through literature review and organization, the resilient security of old residential areas should be evaluated comprehensively from the following aspects.

(1) Infrastructure assessment: assessing the completeness and maintenance status of infrastructure in old residential areas, such as water supply, power supply, drainage, gas, communication systems, etc.

(2) Building structural safety: checking whether the building structure of old residential areas is stable and able to withstand natural disasters such as earthquakes and floods.

(3) Public service facilities: evaluating whether the public service facilities in the community, such as medical care, education, and elderly care, meet the needs of residents and have certain emergency service capabilities.

(4) Community governance and participation: examining whether the community governance structure is complete, the residents actively participate in community affairs, and the community has the ability to organize and respond to emergencies.

(5) Environment and ecology: evaluating the environmental factors such as greenery, air quality, and noise control in the community, as well as their impact on residents' health and community resilience.

(6) Economic sustainability: analyzing the economic situation of old residential areas, including residents' economic ability, property management costs, maintenance funds, etc., to ensure long-term sustainable maintenance of the community.

(7) Social cohesion: evaluating the social relationships and cohesion within a community, which is crucial for its self recovery and mutual assistance during times of crisis.

(8) Emergency preparedness and planning: checking whether the community has emergency plans and plans for various disaster situations, and regular emergency drills are conducted.

(9) Security risk assessment: identifying potential security risks that the community may face and evaluating whether existing measures can effectively reduce these risks.

(10) Intelligence and informatization level: evaluating the development level of intelligent and information-based construction in residential areas, which can help improve the management efficiency and emergency response speed of the community.

Through these evaluation dimensions, a comprehensive analysis on the resilient security of old residential areas can be conducted, and corresponding improvement measures can be formulated to enhance the community's adaptability and resilience to various challenges.

4.3 Renewal countermeasures and implementation paths

The renovation of urban old communities under the guidance of resilient security is a multidimensional and systematic task that requires joint efforts and collaboration from the government, residents, and all sectors of society.

After clarifying the renewal goals and principles and conducting a complete community resilient security assessment, the omissions in the resilient security construction of the community are identified. Afterwards, all parties in the community can carry out resilience improvements to address the pain points. In

response to potential issues, the following renewal strategies and implementation paths are proposed.

(1) Graded renovation: for newly built communities, a community evaluation mechanism is established. Through regular evaluation of infrastructure and other aspects, the aging level of the community is assessed. To avoid large-scale renovations, the community environment could be improved, and the service life of the community could be extended through micro renewal design strategies such as optimizing public spaces and enhancing building appearance. For old residential areas, a comprehensive resilience assessment and resource integration is conducted, and targeted renovation plans are designed for their pain points.

(2) Long-term management mechanism: a long-term community management mechanism is established for the renovated community. The old community used to be a newly built community, but due to the lack of a long-term management mechanism after completion, it is difficult for the community to undergo periodic updates. It should establish a long-term management mechanism led by party building, feedback from residents, (community) organization response, and action from all parties, to ensure that the updated community can continue to maintain a good state.

(3) Differentiated solutions: it should develop differentiated renewal strategies based on the characteristics and needs of different communities to avoid blindly applying the same plan.

(4) Government guidance and planning: the low resilience of old communities is fundamentally due to outdated management models and weak resilience building awareness among community managers. The government should integrate resources from all parties and provide excellent resilience transformation cases for communities to learn, and update community planning and management plans. At the same time, policy guidance has a positive impact on residents' willingness to participate, and the degree of impact is the greatest[4]. The government should formulate corresponding policies and plans to guide the direction and steps of the renewal of old communities, ensuring the orderly progress of the renewal work.

(5) Policy formulation: it should develop policies related to community resilience renewal and provide policy support for the renewal of old communities. In some old communities, there are established behavioral norms and moral standards. Communities are relatively familiar and fixed social relationship networks, and the subjective normative pressure formed by communities is more easily felt by residents and affects the formation of their willingness to participate in governance[4]. In the process of formulating formal systems, the government should respect these "folk systems", and determine their rationality. If necessary, the compatibility between formal systems and "folk systems" could be improved. Community actors should also take action based on institutional rules in their interaction with the government and formal institutions, actively participate in the process of rule making, and provide impetus for institutional change and innovation[5].

(6) Enforcement of regulations: it should strengthen the enforcement of regulations to ensure the protection of legitimate rights and interests during the renewal process.

(7) Resident participation: attitude towards participation has a positive impact on residents' intention to participate[2]. Residents' experiences directly reflect the effectiveness of community resilient governance and have absolute say in the renewal work. In community governance, the strength of participant consciousness is an important factor affecting people's willingness to participate, while the differentiation of interests in governance is a decisive factor affecting people's participation enthusiasm[2]. it should encourage residents to participate in the renewal process, collect their opinions through questionnaire surveys, symposiums, and other methods, to ensure that the renewal work meets the actual needs of residents.

(8) Fundraising: it should establish a diversified funding mechanism, including government investment, social capital participation, and self financing by residents, to provide financial support for the renewal work.

(9) Technical support: with the support of digital technology, the senses of the community have been greatly extended, and the ability to obtain and analyze information has been greatly enhanced. While accurately and comprehensively identifying problems, information technology-based warning systems can clearly mark emergency issues, greatly improving the community's prevention function[6]. By utilizing modern information technology such as intelligent monitoring and data analysis, it could improve the level of intelligence in community management and enhance the community's warning and response capabilities. Community workers should actively learn smart tools and maximize the functionality of existing tools.

(10) Safety and disaster prevention: it should strengthen the construction of safety facilities in the community during updates, such as fire protection and earthquake resistance, to enhance the community's disaster prevention and mitigation capabilities. Continuous monitoring and evaluation: a continuous monitoring and evaluation mechanism should be established to ensure the quality and effectiveness of renewal work, and adjust renewal strategies in a timely manner.

(11) Experience summary: Nanning City actively promotes the construction of the "emergency linkage+" system, and continuously weaves a dense risk prevention and control network. With the emergency linkage center of Nanning City as the main body, it builds a comprehensive monitoring and early warning center for urban safety risks, and further establishes an integrated comprehensive monitoring and early warning institution of "situation, guidance, action, diligence, and supervision"[7]. Optimization paths of community resilience in mega cities under the background of sudden public health emergencies are summarized[8]. The report of the 20th National Congress of the Communist Party of China clearly proposed to "build livable, resilient, and smart cities", which has been actively responded to by various parts of China. The construction of resilient communities is in full swing. During this process, many cases emerged, and existing cases were analyzed and summarized. Combined with the current situation of the community, resilience transformation is carried out, the renewal of cases is used to drive the upgrading of community quality.

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