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Study on the barriers and breakthroughs of resilience building in aging Urban communities from the perspective of risk management: A case study of Jin Guang Men community in Xi'an

Wen Xin Zhao

Department of Humanities and Foreign Languages, School of Xi'an University of Posts and Telecommunications, Xi'an 710061, Shaanxi Province, China; dorethaschue223@gmail.com

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Abstract: The continuous escalation of social risks has exacerbated the challenges faced by aging urban communities. In this context, resilience building emerges as a critical approach, offering new perspectives and innovative solutions to address these issues. This paper applies the theories of risk society and resilience governance to establish an analytical framework for resilience governance, specifically examining the current status of resilience construction within the Jin Guang Men community in Xi'an. The findings indicate that resilience building within these aging urban communities is hindered by issues such as weak grassroots governance, deficient repair mechanisms, inadequate infrastructure, and a slow pace of information technology adoption. To effectively manage social risks, it is imperative to strengthen party leadership in governance, enhance community self-repair capacities, upgrade infrastructure, and accelerate the application of information technology. These measures are essential for bolstering the risk management capabilities of aging urban communities.

Keywords: risk society; older community; resilience governance; emergency management; risk governance

1. Introduction

In recent years, the deepening development of globalization and the increasingly complex disaster scenarios have posed significant resource and environmental challenges to aging cities, also highlighting their vulnerabilities. Against this backdrop, enhancing disaster resilience has become a crucial component of contemporary urban governance. Aging communities, as microcosms of cities, are particularly susceptible to environmental and social risks, mainly due to outdated infrastructure, insufficient resource allocation, and limitations in the application of modern technology. Furthermore, the vulnerabilities of aging communities underscore the urgent need for strategic interventions to enhance their resilience, ensuring they can effectively withstand adversity and recover swiftly.

This study aims to provide empirical insights into the resilience of aging urban communities, contributing to the broader theoretical framework of urban resilience. Using the Jin Guang Men community in Xi'an as a case study, it empirically supports resilience theories in aging urban environments and advances the development and refinement of urban resilience theory through the lens of resilience governance.

The main objectives of this study include: (1) establishing an analytical framework for resilience governance based on risk society and resilience governance theories; (2) exploring the current status and challenges of resilience building in the

Jin Guang Men community; (3) proposing targeted strategies to enhance the resilience of aging urban communities.

The structure of this paper is as follows: The first part reviews relevant literature on risk society and resilience governance theories to lay a theoretical foundation for this study. The second part introduces the analytical framework, elucidating how these theories can inform the disaster resilience building of aging urban communities. The third part details the research methods and data sources used in this study. The fourth part presents the major findings of the Jin Guang Men community case study, highlighting key issues and challenges. The fifth part discusses the implications of these findings for urban resilience governance and proposes solutions. The final conclusion summarizes the main findings of this study and suggests future research directions.

2. Guiding literature

2.1. Understanding and establishing resilient communities

The quickening pace of social dangers has made the advancement of community resilience a central objective of intrigue inquiry. The concept of versatile communities has earned significant scholastic consideration, especially with respect to its definition, crucial components, and commonsense applications. Regularly, a versatile community can successfully react to, alter to, and recoup from outside disturbances, in this manner rapidly returning to a state of commonality (Koliou et al., 2018). For occasion, Davoudi emphasize that the center of a flexible community lies in its capacity to explore vulnerability and alter (Davoudi et al., 2012). The idea of resilience envelops a few measurements, counting financial, social, and natural components, requiring a coordinated approach that combines different assets and capacities.

Worldwide researchers have broadly examined the instruments and methodologies for cultivating community resilience. Norris recommends that resilience can be accomplished through vigorous infrastructure, solid social capital, and compelling utilization of data and communication advances (ICT) (Norris et al., 2008). Cutler highlights the vital part of social capital, contending that believe and shared bolster among community individuals are pivotal for resilience (Cutler et al., 2011). Klein offers an evaluative system for evaluating community resilience, which needs a comprehensive appraisal of a community's resources and capacities to resist outside stuns (Klein et al., 2003). Holling's work on biological resilience gives profitable bits of knowledge into commonsense applications and remains a seminal asset for understanding versatile communities (Burnside et al., 2022).

In China, inquire about on versatile communities has as of late picked up footing and advanced quickly. Gao Han defines a resilient community as one that can maintain stability and functionality through self-regulation and recovery in the face of natural disasters or other emergencies (Gao et al., 2015). Li Qiang broadens this definition to include social, cultural, and institutional aspects, stressing the importance of social networks, institutional resilience, and cultural identity in building resilient communities (Li, 2017). Yang Chen advocates for locally tailored strategies that utilize regional characteristics and resources to establish resilient communities (Yang et al., 2018), while Guo Peng emphasizes the integration of resilient community-

building into urban planning and national policies, proposing a governance model that encompasses multiple stakeholders (Guo, 2020).

2.2. Perspectives on building resilient communities

The concept of resilience building centers on a community's capacity to respond to, recover from, and adapt to risks (Adger, 2000). Walker and Salt contend that the essence of resilience is the ability to adapt and transform amidst change (Klein et al., 2003). In this regard, Paulc suggests incorporating flexible governance strategies into traditional administrative frameworks to harmonize public and private elements within the social-ecological system.

From an emergency management and grassroots governance perspective, Chen Tao conceptualizes "resilient governance" as an inclusive framework for emergency management systems, particularly under external pressures. He underscores the need for management entities to employ diverse strategies for effective risk management (Chen and Luo, 2021). Tang and Wang further argue that resilient governance is crucial at the grassroots level, especially in the digital era. They assert that utilizing information technology to empower grassroots governing bodies can advance the modernization of governance systems, thereby strengthening community resilience.

3. Analytic framework

Risks in current societies, exacerbated by a confluence of multiple factors, have become the focus of much-needed attention. The impact of risks faced by ageing communities is even more far-reaching because of their unique vulnerabilities. These risks not only jeopardize the quality of life of residents, but also seriously hinder the sustainable development of communities. Effective governance and management strategies are therefore crucial for ageing communities.

This study aims to integrate social risk theory and governance resilience theory to construct a systematic analytical framework to explore in depth how aging communities can enhance their resilience and adaptive capacity in changing risk environments so as to promote their sustainable development.

3.1. Theoretical clarification

The theory of Risk Society elucidates a series of complex social phenomena characterized by various uncertainties. These uncertainties have catalyzed transformations at cultural, social, and economic levels, prompting traditional social structures, institutions, and relatable, and configurations. During this transition, establishing mechanisms to effectively integrate and coordinate various forces is crucial to ensure the successful achievement of transformation goals. Consequently, the Risk Society not only signifies a new phase of social development but also underscores the reality of humanity facing significant risk challenges (Beck, 2009).

Moreover, by emphasizing the intrinsic unpredictability of risks, the Risk Society theory provides guidance for the development of aging communities. This guidance points to the enhancement of governance capabilities within older communities through the establishment of risk assessment mechanisms. This perspective allows for

a deeper understanding of the construction and adaptation processes within aging communities, ultimately augmenting their resilience to risks.

3.2. Resilient governance theory

Resilience governance is perceived as an integrative framework within the emergency management system, encompassing a series of strategies and measures formulated and executed across various dimensions such as goal setting, capacity building, and process optimization to effectively address diverse risks faced by communities when confronted with external environmental challenges and shocks. In the development of old urban neighborhoods, resilience governance plays a crucial role (Chen and Luo, 2021). In-depth implementation of resilience governance not only paves an innovative path for the renewal and regeneration of old urban neighborhoods but also significantly enhances their sustainable development capabilities in facing multiple potential future challenges. For instance, adopting participatory governance models and strengthening internal community organization capabilities can effectively boost the self-recovery abilities of old neighborhoods (Zhang, 2021). Further research and practical demonstrations will provide valuable experience for the effective implementation of resilience governance, theoretically support the formulation of related policies, and promote more scientific and efficient community governance practices.

3.3. Analytical framework

This paper proposes an integrated framework for resilience governance in aging communities, focusing on the interlinked aspects of risk society and resilience governance (**Figure 1**).

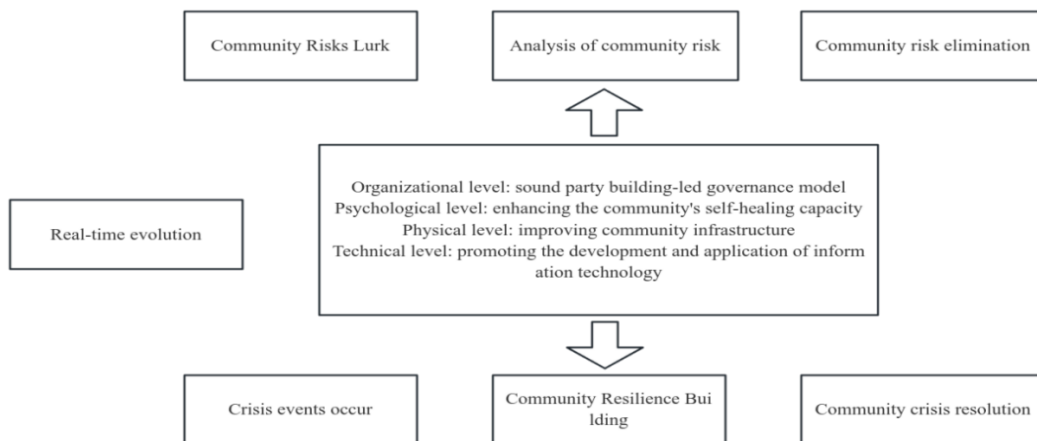


Figure 1. Framework for building resilience from a risk perspective.

The framework emphasizes the intricate relationship between social risks and crisis events, advocating for a comprehensive risk management strategy suitable for aging communities. Unlike previous studies that primarily examined disaster resistance or risk-bearing capacity in isolation, this framework innovatively integrates these two elements, providing a new approach to building disaster resilience in aging communities.

The uniqueness of this explanatory system lies in its orderly and comprehensive nature. Conventional investigation ordinarily centers on post-crisis recuperation, with risk-bearing seen as a preventive degree. This study's system synthesizes these viewpoints, advertising a strong strategy for comprehensively understanding and tending to the resilience challenges in aging communities. By emphasizing the social development of hazards and recognizing the multi-level nature of administration, the system gives a more nuanced understanding of resilience.

Additionally, the framework draws on pioneering works in the field; it incorporates multidimensional description of community resilience and risk governance framework, which elucidates the application of resilience principles in various contexts. The integration of these hypothetical establishments not as it were improves the framework's hypothetical meticulousness but moreover highlights its imaginative down-to-earth application, especially in giving methodological direction for surveying and deciphering resilience challenges confronted by the Jingguangmen community.

In progressing this system, the consider builds on broad writing encompassing disaster resilience and risk governance while tending to existing crevices by presenting the concept of risk-bearing as a crucial component. This commitment not as it were enhances the hypothetical talk on disaster resilience but moreover lays the foundation for future experimental inquire about pointed at upgrading community resilience in maturing urban environments.

4. Research methodology

Based on the theories of risk society and resilient governance, this study constructs a comprehensive analytical framework. Through a combination of case studies and semi-structured interviews, the research aims to elucidate the practices of disaster resilience building in the Jin Guang Men community of Xi'an. The study seeks to uncover the challenges faced by this community in building disaster resilience and identify the underlying causes.

4.1. Research methodology

The sampling strategy employed in this study is purposive sampling, focusing on Jin Guang Men community as a representative of aging urban communities in Xi'an. The criteria for selection include population composition, aging infrastructure, and susceptibility to various social risks. This purposive sampling technique ensures that the characteristics of the selected community can represent a multitude of challenges faced by aging urban communities, thereby providing insightful data in the broader context of community disaster resilience.

4.2. Data collection

Data were collected through a series of systematic semi-structured interviews. In-depth interviews with 30 key stakeholders, including community managers and elderly residents, were conducted. Each interview lasted approximately 60 to 90 min, aiming to gather detailed insights into the practices of community resilience, encountered challenges, and existing governance structures. This approach not only facilitates an

understanding of the community context but also explores individual experiences and perspectives in building disaster resilience.

4.3. Participant selection criteria

The criteria for selecting interview participants were as follows:

Age: Participants included both elderly residents (60 years and older) and younger community members to capture diverse perspectives.

Role: Selection was based on the roles of key stakeholders, including community managers and active participants, ensuring insights from various levels of community governance.

Engagement: Priority was given to individuals actively involved in community activities or experienced in addressing community issues. This criterion was crucial to ensuring participants could provide well-informed and meaningful contributions during discussions.

4.4. Data analysis techniques

Qualitative data collected from the interviews were analyzed using the following methods:

Qualitative Content Analysis: This method involved systematically coding and categorizing interview transcripts to identify recurring themes and patterns. By organizing data into meaningful categories related to community resilience, this approach facilitates a structured analysis of study findings.

Thematic Analysis: This analysis was employed to delve deeper into identified themes, aiming to understand the root causes of resilience challenges faced by the community. By focusing on the strategies and adaptive measures undertaken by community members, this analysis provides comprehensive insights into existing disaster practices and informs the development of targeted enhancement strategies.

This methodological framework ensures an in-depth investigation into the disaster resilience challenges of the Jin Guang Men community while enhancing the overall rigor and efficacy of the research findings.

5. Result

5.1. Analysis of the current situation of community resilience building in Jin Guang Men

The Jin Guang Men Community, located in Xi'an City, Shaanxi Province, encompasses three residential neighbourhoods with a total population of 940 households and 1921 individuals. Of these, approximately 1634 are elderly individuals over the age of 60, representing 85% of the population's aging cohort. The community is equipped with infrastructure such as senior citizen apartments and a caring cafeteria to meet the daily needs of the residents. It is anticipated that the community will be awarded the title of "Green Community" in 2022.

Most residents are retired workers relying primarily on pensions as their main source of income, with limited capacity to work. Additionally, most neighbourhoods are improperly fenced and ungated, which adds complexity and difficulty to governance

issues. Enhancing the risk governance capacity of the Jin Guang Men community and building a resilient community structure is both necessary and urgent.

Problems of Jin Guang Men Community in Resilience Building:

Weak Governance at the Grassroots Level: The Jin Guang Men community, comprising three “three-less neighborhoods” and overseen by only three staff members, faces significant governance challenges. The lack of personnel at the community level hinders the timely fulfilment of residents’ daily needs, impairing the efficiency and quality of community affairs. This limitation constrains the community’s capacity to respond promptly to emergencies. The community’s property management is outsourced, a model inadequate to meet the community’s diverse needs. Financial constraints lead to frequent changes in management, resulting in a lack of understanding of the community’s specific conditions by the property management company. This hinders the company’s ability to serve residents and address their daily needs effectively. Additionally, most community residents are retired seniors accustomed to the planned economy, leading to a dependency on third-party service providers and reliance on external management organizations to fulfil daily needs. This dependency creates difficulties in defending their interests and obtaining necessary services.

Low Attention to Psychological Construction: The Jin Guang Men community faces significant constraints in terms of facilities for cultural activities and lacks sufficient venues to organize rich and diverse cultural activities. Currently, the Jin Guang Men community relies mainly on community offices to conduct cultural activities, but the activities are limited in form, lacking diversity and innovation. This limitation makes it difficult to utilize cultural resources efficiently and limits the potential for cultural dissemination. Additionally, the community’s residents, mainly elderly people over the age of 70, have relatively low interest in participating in community cultural activities. This lack of participation hinders the formation of community culture, affecting the breadth and depth of cultural dissemination in the Jin Guang Men community and reducing the efficiency and effectiveness of policy implementation.

Infrastructure Maintenance Lagging Behind: Established in the 1990s, the Jin Guang Men community’s initial planning and layout no longer meet residents’ growing and changing needs. Narrow and dilapidated roads and an irrational spatial layout constrain the community’s resilient development. Such layout constraints not only affect residents’ daily lives but also severely limit the community’s responsiveness and efficiency in dealing with various disasters and emergencies. Additionally, the water and power supply lines, underground pipe networks, sewage pipes, and other infrastructures have fallen into disrepair due to a lack of effective maintenance over time. Some aging lines are even exposed, leading to functional impairment and increased safety risks in the community.

Slow Construction of Information Technology Platforms: In terms of information management, the Jin Guang Men community still relies on traditional methods. Paper media is used to record and categorize information, which is subsequently entered into various reports by hand. This manual data entry process is time-intensive, especially when handling a large amount of community information. It consumes considerable human resources and prolongs the overall information processing cycle.

5.2. Risk perspectives on obstructive performance of resilience building in Jin Guang Men neighborhoods

Organizational Level: Research indicates that the grassroots governance framework in the Jin Guang Men Community is incomplete. Interviews reveal that major decisions or actions by the residents' committee often require prior approval and support from higher government departments. This top-down governance model severely undermines the autonomy of the residents' committee, making it difficult to respond promptly to community emergencies. Moreover, this hierarchical dependency not only delays the decision-making process but also increases the complexity of governance. When the residents' committee interacts and coordinates with higher departments, information transmission often suffers from delays and distortions, thereby impacting the efficiency of internal problem-solving within the community. More critically, this governance model limits residents' sense of participation and ownership, thereby reducing their enthusiasm and initiative to engage in community governance.

Psychological Aspects: The absence of Jin Guang Men Community resilience mechanisms reveals that the Jin Guang Men community is facing collective challenges. Rapid urbanisation and population migration not only heighten the risks to cultural identity but also intensify conflicts between residents and newcomers. Some community members have confirmed this cultural discord and emphasized its adverse impact on the overall resilience of the community. Additionally, lagging infrastructure and insufficient community services have led to a decline in residents' quality of life, further weakening their sense of belonging, and thus reducing social cohesion and collective resilience.

Physical Aspects: Through field investigations in the Jin Guang Men community, we found a lack of basic risk management and warning systems, which not only exacerbates the risk of property theft but also causes widespread unease and anxiety among residents. Furthermore, the facilities in public areas are deteriorating, with many fitness equipment, children's playgrounds, and seating showing signs of damage, affecting residents' user experience. Insufficient lighting facilities make residents often feel apprehensive when travelling at night, thereby limiting their willingness to engage in activities in public spaces, further reducing opportunities for community participation. This lack of self-engagement exacerbates the community's vulnerability.

Technology Aspects: Through our field survey of Jin Guang Men communities, we found that these communities have old IT facilities and are overly dependent on external experts. This dependency weakens the community's ability to address crisis events, making it difficult to face emergencies. Second, the cost of building intelligent systems is high for aging communities like Jin Guang Men Community. This economic pressure makes it often hesitant to introduce new technologies to effectively improve the quality of services and the convenience of residents' lives. Through in-depth interviews with community managers and residents, we learned that the phenomenon of lagging behind in the construction of intelligence is common, which not only affects the operational efficiency of the community, but also further exacerbates the concerns and uneasiness of the residents.

5.3. A new approach to building resilience in Jin Guang Men communities from a risk perspective

At the Organizational Level: Evidence gathered from field surveys and interviews indicates that strengthening the role of party organizations in risk management can significantly enhance community governance capabilities. It is recommended to place grassroots party organizations at the core of disaster resilience-building activities, promoting a governance model of “multi-stakeholder participation and shared responsibility.” In this context, cooperation among government levels, community organizations, and residents becomes crucial. This involves clarifying the roles and responsibilities of various stakeholders, including local governments, community organizations, and residents. Locks in inhabitants within the decision-making process are not as it democratizes administration but too leverages the assorted encounters and bits of knowledge of community individuals. Standard joint meetings and collaborative planning sessions can upgrade straightforwardness and belief, permitting partners to share experiences and procedures, subsequently cultivating a bound-together reaction to challenges.

At the Psychological Level: Concurring to study discoveries, upgrading the community’s self-repair capability may be an imperative suggestion. By coordinating and advancing neighborhood social components, residents’ cultural identity and sense of having a place can be fortified. Planning and actualizing different community activities to meet the wants of diverse inhabitants can boost community cohesion and interaction. Exercises such as workshops sharing community histories, art exhibitions highlighting nearby craftsmen, or community gardening ventures can energize inhabitant interest and inculcate pride in community conventions. Furthermore, teaching inhabitants and giving psychological support to raise hazard mindfulness can empower dynamic interest in risk management endeavours. This approach not as it were upgrades residents’ capabilities but more over enhances community bonds and collective disaster resilience, making a more coordinated and responsive community system.

At the Physical Level: Overhauling community infrastructure is crucial to moving forward disaster resilience. Investigate advocates for quickening infrastructure enhancements and optimizing public space assignment as methodologies to improve governance capabilities and keep up open arrangement. Embracing a lifecycle administration approach in arranging and actualizing ancient neighborhood redesigns is basic, centering on preventive measures, risk warnings, and remediation endeavors to form a more secure, more economical living environment. Consolidating residents’ conclusions in these plans will reinforce their sense of character and guarantee overhauls meet particular community needs. This could incorporate participatory design forms, where community individuals collaborate to create public space solutions, ensuring their needs and inclinations are reflected.

At the Technology Level: The headway of information technology could be an urgent component in upgrading community disaster resilience. Setting up a proficient risk warning and checking stage will precisely distinguish dangers and encourage quick reaction through shrewdly frameworks. This proactive approach can altogether move forward community disaster resilience and diminish potential misfortunes. Field

research and data analysis propose that quickening the development and updating of information technology frameworks can particularly progress community administration productivity. Additionally, guaranteeing comprehensive scope of smart technologies, such as community alert systems and information-sharing platforms, can improve residents' by and large quality of life and fulfillment. For example, implementing mobile applications that enable residents to report issues, access community activity information, and receive safety alerts. By bridging technological access gaps and improving residents' digital literacy, communities can foster a more informed and closely-knit neighborhood.

6. Conclusions

The theories of risk society and resilient governance offer novel insights into the transformation of aging communities. The frequent occurrence of risky events in older communities necessitates the construction of more resilient older communities. Such communities not only improve their risk coping capacity but also protect the personal safety of residents. The construction of more resilient older communities is of great significance for the enhancement of community governance capacity. This paper first conducted a comprehensive review of the relevant literature on old communities and resilience construction both domestically and internationally. This review served to stimulate self-reflection and inform the subsequent article.

This paper takes Jin Guang Men Community in Xi'an City as the research object. The objective is to analyze the problems existing in the resilience construction of Jin Guang Men Community and to analyze the realistic dilemma of resilience construction of it from the levels of organization, psychology, physics, technology, etc. The aim is to put forward a breakthrough path for the resilience construction of it accordingly. Through the author's field visits and interviews, it was found that the current Jin Guang Men community is facing a number of challenges in its resilience construction efforts. These include difficulties in property management operations, low levels of resident participation, a mismatch between service capacity and demand, a lack of willingness among residents to participate in community activities, delays in infrastructure construction, and the slow development of technology. On the basis of clarifying the specific problems, the obstacles to resilience building in Jin Guang Men communities are analyzed in depth. The analysis reveals that these obstacles are mainly manifested in the loosening of grassroots governance bodies, the lack of community restoration mechanisms, lagging behind in the construction of supporting facilities, and slow application of information technology. In light of the challenges and underlying causes of resilience construction in Jin Guang Men Community, the article proposes innovative pathways for resilience governance. Firstly, at the organizational level, it is necessary to improve the governance model led by the party building and to put forward the strategy of constructing a community risk community. Secondly, at the psychological level, it is necessary to enhance the ability of the community to self-repair and to put forward the strategy of fully tapping the unique cultural value of the old communities. Thirdly, at the physical level, it is necessary to improve the community infrastructure and to improve the community infrastructure. Additionally, at the technical perspective, it is focus on the facilitate the growth and

integration of information technology and propose the implementation of intelligent risk management tools in aged communities.

Conflict of interest: The author declares no conflict of interest.

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