

Article

What Leads to Effective Emergency Management? A Configurational Analysis of Empirical Cases of Local Chinese Governments

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Abstract: This study investigates the foundational elements that contribute to effective emergency management in urban settings, with a particular focus on experiences from Chinese municipalities. Drawing on resource dependence theory and attention allocation theory, this research develops an analytical framework encompassing four pivotal factors: environmental resources, information sharing, social participation, and leadership attention allocation. Utilizing Qualitative Comparative Analysis (QCA), we examine these factors across sixteen critical incidents of urban accidents and disaster responses in China. Our findings reveal that a high degree of leadership attention allocation is an essential prerequisite for municipal governments to exhibit robust emergency management capabilities during crises. Furthermore, two primary pathways affecting emergency management capacity were identified: the “resource–leadership attention type” and the “social participation–resource coordination type”. These findings contribute to a nuanced understanding of the complexities of emergency management and enlighten the local governments to take some effective measures to enhance emergency management capacities to mitigate disaster losses.

Keywords: urban emergencies; local government; emergency management capacity; qualitative comparative analysis



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1. Introduction

Urbanization, as an engine of growth, has significantly propelled economic prosperity. Yet, with a higher density of land use and unprecedented urban agglomerations, it has also ushered us into a society fraught with risks. Various emergent events have manifested complex challenges characterized by high occurrence rates and extensive impacts, which have seriously affected national development and societal stability. Local governments are the tier of government most directly accessible to the public and are the first line of governmental public responsibility [1]. In the event of a disaster, local governments are the first to need to respond to the emergency, and it has a responsibility to protect communities from harm. Traditionally, emergency management is mainly led by the central government, but with the increasing social risks, the involvement of local governments is gradually increasing, and communication and collaboration between the central and local governments are becoming increasingly important [2]. The prominent role of local governments relative to the central government has also been demonstrated from previous research on the role of government in disaster management [3], and local governments can contribute to the improvement of disaster management by strengthening their participation and leveraging their strengths. The traditional governance approach, centered on disaster prevention, is no longer sufficient for current and future emergency management needs. Therefore, it is necessary to build comprehensive emergency response mechanisms to improve the local government’s capabilities for better emergency management [4]. Enhancing the capacities

of emergency response and management is an urgent matter for local governments. The enhancement of government emergency management capabilities through the study of various emergencies is imperative for modern urban governments facing all immediate risks. In addition, the government's capacity to address emergencies swiftly and effectively significantly influences its public reputation and image, which in turn has important ramifications for the country's political and economic progression. In disaster risk governance, governments need to make clear plans and coordinate stakeholders both within and across departments. By facilitating disaster prevention, mitigation, preparedness, response, recovery, and rebuilding efforts, the goal is to strengthen disaster risk governance frameworks to significantly reduce the risk of disasters [5].

Enhancing the government's emergency management capacity necessitates the structured classification of public emergency cycles. This approach aims to scientifically identify the most effective emergency response measures for each phase of an emergency. Public emergencies usually follow a specific life cycle. For each level of public emergency, there are stages of occurrence, development, and mitigation that require different emergency response measures. This categorization serves as a fundamental guideline for governmental emergency actions, whether to prevent disasters, mitigate their effects, or facilitate recovery. Alexander [6] outlines disaster management in four key phases: mitigation, preparedness, response, and recovery (refer to Figure 1).

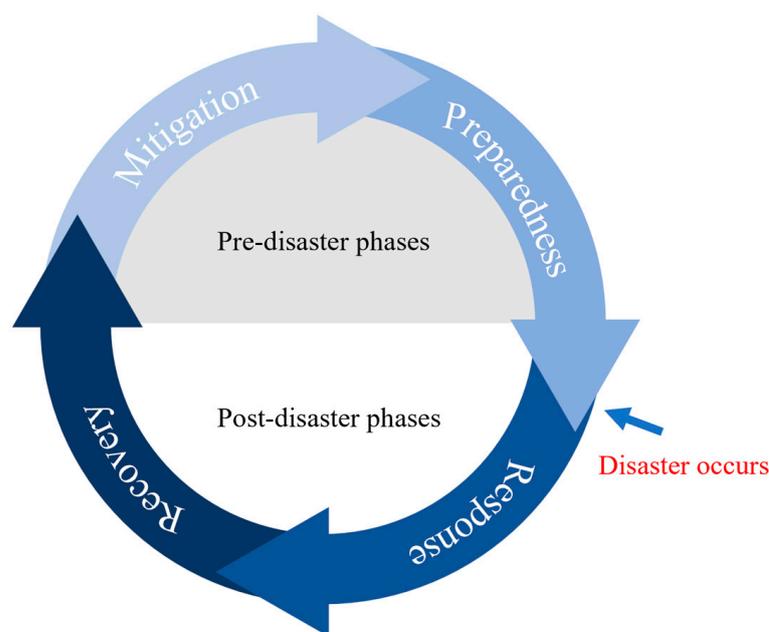


Figure 1. Disaster risk management cycle (adapted from Boshier and Chmutina [7]).

- (1) **Mitigation**—This phase is dedicated to preventing incidents before they happen. It involves conducting risk assessments and implementing public education programs to raise awareness about potential hazards.
- (2) **Preparedness**—This phase focuses on readiness for potential emergencies. Key activities include the development of comprehensive emergency plans and the establishment of emergency supplies and reserves.
- (3) **Response**—When an emergency occurs, this phase involves the immediate activation of emergency plans and the deployment of emergency personnel to address the situation.
- (4) **Recovery**—This phase is centered on restoration and healing after disasters. Efforts include repairing damaged infrastructure and offering economic assistance to those affected.

The disaster management cycle is a cyclical process. Lessons learned from the recovery phase can be used to improve and strengthen activities in the next prevention and preparedness phase of the cycle, which helps to reduce the risk and impact of future emergencies.

Following an emergency, the vast majority of local governments assume responsibility for preparedness, mitigation, response, and recovery. In many states in the United States, county governments are very important, and they are responsible for coordinating emergency response at all levels of government, departments, agencies, and community organizations within their jurisdictions, as well as being directly responsible for a number of emergency relief and recovery efforts [8,9]. Currently, the handling of public safety emergencies in urban construction in China remains a collaborative model dominated by local governments with participation from other social entities. Given that local governments are often the first responders after the onset of an emergency [10,11], this study focuses on the pivotal role they play in safeguarding urban public safety. Emergency management generally implies the need for governments to respond to all emergencies, regardless of the severity and scope of the emergency that occurs. Since local governments need to respond quickly in emergencies and provide appropriate personnel and material resources for rescue, they must have a comprehensive disaster response plan in place before an event occurs and integrate emergency management into their usual work [12].

The concept of emergency management capacity lacks a unified and clear definition within the academic community. The capacity of local governments in the United States varies from state to state, and although the terms “capacity” and “capacity building” are commonly used by public officials and public administration scholars, their meaning is unclear [13]. Capacity building has been emphasized in emergency management since the mid-1990s and the capacity requirements of governments vary across the four phases of disaster management. In the mitigation phase, capacities such as assessment, monitoring, and dissemination are required; in the preparedness phase, capacities such as planning and exercises are required; in the response phase, capacities such as assessment and information interaction are required; and in the recovery phase, capacities for damage assessment and restoration are required [14]. Han [15] delineates emergency management capability as the encompassing set of competencies held by the emergency management entity, ranging from specialized knowledge to the ability to marshal resources throughout the incident, categorizing these into three tiers: state-level, emergency management departments, and individual emergency professionals. In practice, when confronted with identical emergency situations, local governments—as principal agents in emergency management—demonstrate varied responses and strategies, which ultimately lead to divergent outcomes. Such variations highlight the differing levels of emergency management capabilities among local governments. Among natural disaster hurricanes, Hurricane Katrina in the United States revealed a major failure of government crisis management capabilities [16]. A lack of knowledge of emergency management and proactive leadership on the part of government officials led to a major disaster in the case of Hurricane Katrina. This raises serious questions about the capacity of the local, regional, and central government. Survey results indicate that in current disaster reduction efforts, local governments lack a sufficient number of capable technical personnel. On average, only 28% of local governments believe they possess the necessary technical expertise to carry out various disaster reduction actions, highlighting a significant deficiency in the disaster reduction capabilities of local governments [17]. Similarly, by comparing the policies of 10 different governments around the world in response to COVID-19, scholars have found that different governmental responses to the same problem can lead to different levels of effectiveness in controlling outbreaks [18]. By analyzing the emergency management capacity of local governments in different regions of China, Tang [19] found that there are differences in the emergency management capacity of local governments in the northeastern, central, eastern, and western regions. Reflecting on the findings of Tang’s research and the realities on the ground, this paper posits that the local government’s emergency management capability is the array of behavioral responses and management actions undertaken by local authorities and their associated departments

during crises within a risk society. This behavioral performance is indicative of the overall efficacy and quality of a local government's approach to emergency management.

Existing studies have identified several factors that significantly influence urban government emergency management capabilities, such as resources, smooth information exchange, and cooperation among multiple actors, which help governments to respond quickly to emergencies and thus carry out timely rescue operations. Compared with the existing studies, the possible innovations of this study are reflected in the following aspects. In the research topic of factors affecting emergency response capacity, most of the research is based on individual factors or focuses on the construction of macro factors such as the evaluation index system of local government emergency management capacity. This study, grounded in resource dependence theory and attention allocation theory, constructs an analytical framework that includes four key factors influencing the government's emergency management capacity: environmental resources, information sharing, social participation, and leadership attention allocation, which can complement the existing research results and expand the research perspective. In a risky society, the types of emergencies are complex. Different types of emergencies have a large process of change, which not only achieves different results but also has large differences in the actions taken by the government. It is difficult to study a single type of emergency to summarize the rules. Research addressing the role of local governments in emergency management differs between developed and developing countries, with more research in developed countries and less research on local governments in developing countries [1]. There is a scarcity of research tailored to China's unique urban emergency management context, particularly in evaluating the emergency management capacity of local governments and fewer impact factors combination analyses based on all-hazard types and cross-time period cases.

This study collects various types of emergencies occurring in Chinese cities and analyzes and compares the government emergency management capacity manifested in four types of public emergencies occurring at different times. It systematically and comprehensively analyzes the factors and driving paths affecting the emergency management capacity of local governments. It also enriches the empirical findings on the emergency management capacity of local governments. In terms of research methodology, the existing quantitative studies by domestic and foreign scholars are more devoted to exploring the direct causality that affects the emergency management capability of local governments and focusing on individual factors. This study applies qualitative comparative analysis methods. By focusing on the mutual effects between multiple influencing factors, it attempts to enrich and improve the methodological application in the study of local government emergency management capacity. The objective is to unravel the different factor combinations that result in either high or low emergency management capacities at the local government level. These varying combinations represent distinct causal mechanisms that lead to equivalent results.

2. Analytical Framework

Significant progress has been made in identifying the factors that influence emergency management capacity during urban crises. Investigations into urban emergency management capacity have honed in on two principal dimensions. The first dimension involves proposing targeted measures and recommendations to bolster emergency management capacities, addressing the spectrum of challenges encountered in contemporary emergency management. The second dimension encompasses the adoption of a diverse array of research methodologies to develop an evaluative framework for emergency management capacities. As the research develops, scholars are increasingly directing their attention toward the determinants of urban emergency management capacity. They scrutinize these determinants across various strata and from multifaceted viewpoints, aiming to uncover the fundamental constraints that impede the optimization of emergency management capacity. From the macro perspective, scholars have constructed a series of indicator systems to assess the government's emergency management capability in the four stages of emergency prevention, preparedness, response, and recovery. These indicator systems

cover a variety of aspects, such as emergency plans, risk assessments, emergency drills, and emergency resource reserves. The assessment of these indicators can quantify the level of the government's emergency management capability and provide a reference for improving emergency management. From a micro perspective, some studies have pointed out that factors such as public participation, resources, networks, and environmental perceptions can, to a certain extent, affect local emergency management capacity.

Emergency management capabilities include human resources, effective implementation of policies, financial and technical resources, and leadership, and how well these capabilities function is also a key factor in the success of emergency management [1]. Governments must have the "right" amount of resources and preparedness for emergency management, not too much and not too little [20]. The COVID-19 pandemic tested local government emergency preparedness, with small, resource-poor governments having insufficient response capacity [21]. Attention is also a resource that is limited, and the behavior of individuals or organizations toward events depends on the allocation of their attention [22]. Different people allocate different amounts of attention to a crisis, and they react differently to it [23]. Timely and rational rescue operations after emergencies are based on effective communication between organizations, and in the absence of information exchange, local authorities may be forced to make poor decisions based on fragmented, inaccurate, and incomplete information [24,25]. For rescuers, if they have accurate information, they can quickly locate and help the victim. However, in practice, rescuers do not have access to victims' information [26]. A wide range of communication technologies is already being used in emergency management to help organizations share information and coordinate cooperation. The United States National Emergency Management Network (NEMN) is made up of the Federal Emergency Management Agency (FEMA) and its counterparts at the state and local level, emergency response agencies, voluntary organizations, and private companies that provide vital disaster relief and consulting services, among others [27], which enables all parties to come together to participate in.

By reviewing the relevant literature, we initially identify the conditions that affect the emergency management capacity of local governments. Resource dependence theory emphasizes that "resource interdependence is the basis for organizations to adopt collaborative governance", which provides a theoretical basis for selecting the condition variables "environmental resources" and "information sharing" [20]. The theory emphasizes that resource interdependence between organizations is the basis for collaborative governance. In emergency management, local governments need to cooperate with other organizations to obtain necessary resources and support. Therefore, the adequacy of environmental resources and information sharing affects the ability of local governments to manage emergencies. Leadership attention allocation theory suggests that the degree of attention a leader pays to a certain task affects the execution of that task, which lays the foundation for the selection of the conditional variable "leadership attention allocation" [22]. At the same time, combined with the findings of other domestic and foreign scholars in the literature review, we extracted the conditional variable "social participation", which has been mentioned repeatedly in the existing studies [27]. To summarize, this research develops an analytical framework encompassing four pivotal factors, as shown in Figure 2, including environmental resources, information sharing, social participation, and leadership attention allocation. This study collects cases of various emergencies and utilizes the QCA methodology to clarify the influencing factors of the local government's emergency management capacity. It explains what determines the sufficient and necessary conditions for a high level of government's emergency management capacity and effectively guides the emergency response work in the areas where major accidents and disasters are rescued.

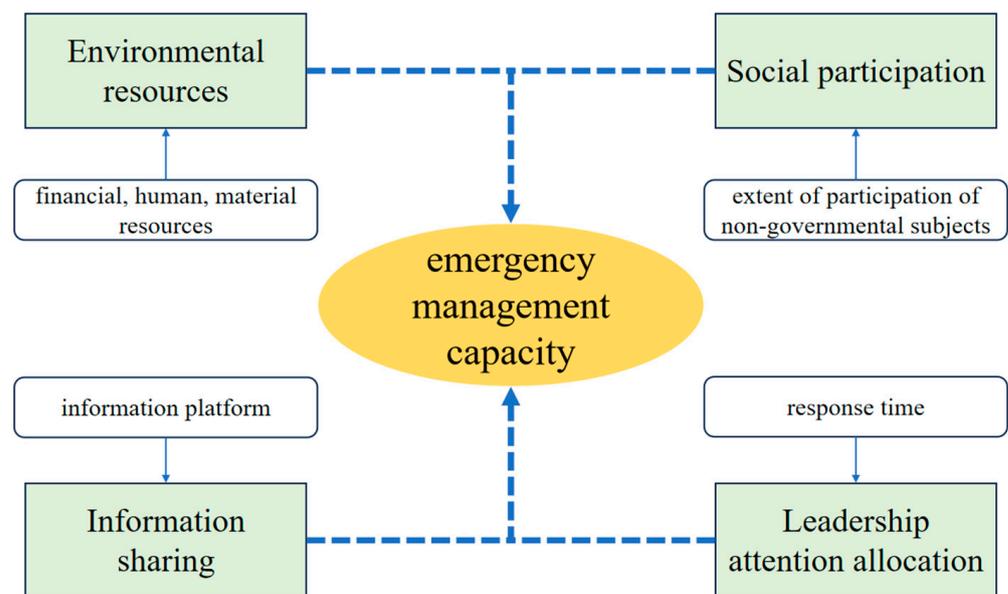


Figure 2. Analytical framework of the configuration effect of emergency management elements (adapted from Ruyi Shi [28]).

2.1. Environmental Resources

Local governments often perform poorly during the disaster phase owing to a lack of adequate resources and sound and legitimate disaster planning, which in turn hinders the development of emergency management capacity [29]. For example, in the 2021 floods in Henan Province, some local governments lacked sufficient rescue materials and equipment, which led to slow progress in rescue work, resulting in casualties and property damage. Activities in all phases of disaster management need to be supported by having sufficient financial resources, so it is crucial to improve the financial capacity of local governments [1]. The prevention stage requires investment in the construction of disaster prevention facilities and disaster prevention publicity and education; the response stage requires investment in the purchase of relief materials and equipment and the conduct of emergency relief work; and the recovery stage requires investment in post-disaster reconstruction. It can be seen that internal and external resources are important factors in government emergency management. The resource dependence theory can explain well the importance of resources in government emergency management.

Resource dependency theory, which emerged in the 1940s and gained traction in the study of organizational relationships in the 1970s, posits that an organization's primary aim for survival is to mitigate its dependence on essential external resources and to secure consistent access to these resources. The theory underscores that organizations must procure resources from their environments to endure and that interdependence and interaction with these environments are critical for organizational survival and growth. A seminal work in this field is "The External Control of Organizations: A Resource Dependence Perspective," written by American sociologists Jeffrey Pfeffer and Gerald Salancik [30]. The core tenets of this theory include:

Firstly, organizations are not self-sufficient entities; they are embedded within a network of other organizations and must source various scarce and valuable resources from their environment, making them inherently dependent on their operational context. Secondly, to access necessary resources, organizations must forge connections with other entities that control these resources. An organization's survival and prosperity are significantly influenced by its capacity to engage and interact with the external environment—the holders of the resources. This environment exerts influence and imposes constraints on an organization's structure, operations, and potential for future development. Thompson and McEwen argued that organizations have some difficulties in dealing with their

external relationships; on the one hand, the organization becomes more connected to another organization, and it can rely more on the performance of the other organizations. However, at the same time, it loses some of its own independence and judgment [31]. Thirdly, organizations strategize to lessen their dependence on the external environment and to manage external pressures. They may diminish the power of other organizations by reducing reliance on a singular key resource and altering their interdependence through environmental control [32].

Resource dependency theory is also pertinent to local governments' responses to urban emergencies. In the emergency management context, where resource scarcity is often intensified by the magnitude and severity of the event, interdepartmental collaboration becomes essential. This creates a symbiotic interdependence among the departments engaged in emergency management.

Based on the abovementioned, the article posits that the availability of ample environmental resources can potentially bolster the government's capacity for emergency management.

2.2. Information Sharing

In emergency management, information sharing and integration are essential to build and maintain collaborative relationships between organizations, and one of the key factors limiting the ability of organizations to respond quickly is a lack of information, so finding effective means of exchanging core information between organizations is essential to improving disaster risk preparedness [26]. Obstructed organizational communication channels affect the ability of organizations to mobilize information and resources in an emergency response, which prevents local organizations from accessing the resources and critical information they need during an emergency response [33]. Effective communication can help all actors involved in the rescue to better understand the crisis and take appropriate measures to deal with it, thus reducing the negative impact of the crisis [34]. Kapucu's research employed a comparative analysis of community responses to hurricanes in areas with similar geographic conditions, evaluating not only the efficacy and scientific underpinnings of emergency response strategies but also examining the fluidity of information exchange among responders and the influence of technology on intersectoral collaboration during emergencies [10]. The study highlighted how well-designed response plans, effective communication among stakeholders, and technological integration contribute to successful emergency responses [10].

The current landscape of the Internet and social media has introduced unprecedented levels of disruption. With global mobile phone penetration now at an impressive 96%, the capacity for distributing timely alerts to at-risk populations has significantly expanded. A prime illustration of this is the distribution of earthquake warnings through mobile networks. This technological advancement ensures that critical information reaches people quickly, potentially saving lives by allowing individuals to take precautionary measures before disaster strikes [35]. As the incident develops, the dissemination of information through social media can allow the public to learn about the relevant information in a shorter period of time, and at the same time, higher-level decision-makers can use this information to coordinate with other subjects [36]. Li and colleagues' study presented a case study on the use of social media platforms during the initial phase of the COVID-19 outbreak in Wuhan, showcasing their role in mediating China's prevention and control efforts. These platforms facilitated public engagement, government information dissemination, and the establishment of an efficient response network [37].

Information infrastructure and access to information are critical for decision-making and effective emergency response [38], providing decision-makers with comprehensive, accurate, and timely information to help them make the right decisions to develop an effective emergency response. Comfort and Zhang [39] applied semi-structured interviews to explore the link between advanced information infrastructures and the effectiveness of cross-sectoral emergency management.

Building on these insights, this paper argues that timely and effective information sharing can potentially elevate the government's emergency management capacity in post-emergency responses.

2.3. Social Participation

Disaster reduction is an ongoing strategy that requires the participation of multiple stakeholders, including government entities, technological and educational institutions, professionals, commercial interests, and local communities. To achieve disaster mitigation goals, it is essential to incorporate the actions of all stakeholders into planning and development strategies while promoting information exchange and sharing [40]. Urban emergencies are characterized by rapid spread, high levels of destruction, and a broad impact, making them challenging for any single managing entity to address alone. Consequently, the establishment of an inclusive emergency cooperation framework is imperative, enabling diverse subjects to engage actively and manage emergencies effectively [41]. After an emergency, the public can provide assistance to emergency management personnel by collecting information and soliciting resources, as well as autonomously assisting other subjects in rescue and reconstruction work, effectively supplementing the government's emergency rescue forces and reducing the pressure on the government's rescue efforts. Scholars use the Portola Valley in California as a case study to explore the relationship between public participation and disaster management, and the conclusions show that when public participation is incorporated into disaster management planning and community planning, disasters will be mitigated to a certain extent [42].

On the one hand, the government and CSOs (NGOs, Red Cross, etc.) should work together to improve community emergency response capacity [43], and on the other hand, the government should strengthen guidance and support for CSOs and provide policy guarantees and financial support for CSOs' participation in community disaster response. In a similar vein, Krogh's empirical study on local emergency management in Norway and Denmark underscores the pivotal role of volunteers in the aftermath of disasters [44].

Drawing from the above discussions, this paper argues that robust and proactive social participation has the potential to enhance the government's emergency management capacity.

2.4. Leadership Attention Allocation

In local government emergency management, leadership decisions affect the organization's overall response capability. Leaders' attention and support are indispensable for establishing an efficient emergency response system, which determines the ability of the government to make quick decisions and formulate effective emergency response measures after an emergency event occurs, thus reducing the damage caused by the emergency. The attention perspective has been used in previous studies in organizational innovation contexts to capture how leaders' attention affects organizational innovation outcomes [45] and is similarly applicable to emergency management scenarios.

Attention allocation theory has been widely applied across various disciplines, each adopting a distinct research orientation. Herbert Simon [46], an early influencer in organizational studies, introduced the concept of attention within the management sphere, characterizing it as the selective concentration of managers on specific information while disregarding others. Building upon Simon's work, Sproull and colleagues [47] described attention as the process by which decision-makers notice, process, interpret, and prioritize stimuli. Subsequently, Ocasio [22] expanded on these ideas, defining attention in organizations as the allocation of time and energy by decision-makers towards issues and their resolutions. In these contexts, the primary focus of attention is consistently placed on the "manager".

In the realm of public management in China, there is a particular emphasis on the significance of leadership attention allocation within the public policy process, as it is seen to have a considerable impact on policy implementation. For this study, the subject of attention is the local government, particularly the leaders and decision-makers orchestrating

emergency relief efforts post-crisis. Within local governments, the extent of leaders' attention allocation to emergencies is pivotal, influencing the actions of responsible parties and, consequently, the progression of emergency response operations. The allocation of attention by leaders in local governments translates into organizational intent and action [48].

Based on these observations, this paper posits that a high level of leadership attention allocation can potentially enhance the government's capacity for emergency management. This section elaborates on the connotation of emergency management capability, reviews relevant literature, initially identifies four influencing factors, and constructs the analytical framework of this paper.

3. Methods

3.1. Research Method

The qualitative comparative analysis (QCA) method, introduced by American sociologist Charles Ragin in 1987, is adept at handling small to medium-sized case samples (10–60). It serves as a bridge between qualitative and quantitative approaches, particularly excelling at discerning patterns and configurations of factors that contribute to a certain outcome. QCA typically commences with the gathering of qualitative data through interviews, document analysis, or surveys to pinpoint potential causal elements and their variations. The cases selected for this study belong to different types and most of the individual variables are not dichotomous variables of 0–1, so the fuzzy set qualitative comparative analysis method (fsQCA) was chosen, which is a method that allows the antecedent variables to belong to some set of continuous variables [49]. FsQCA fits the causes approach most because this approach aims to reveal the minimal (combinations of) conditions bringing about a particular outcome in specific cases [50]. This study is a comparative study of multiple cases of different types to discover the commonalities, to identify the sufficient and necessary conditions affecting the government's emergency management capacities, and to effectively guide the emergency response to regional disaster relief. Utilizing the fsQCA3.0 software, this study conducts fsQCA to investigate the factors influencing the emergency management capacity of local governments across 16 emergency cases in China. The process of the fsQCA method is depicted in Figure 3.

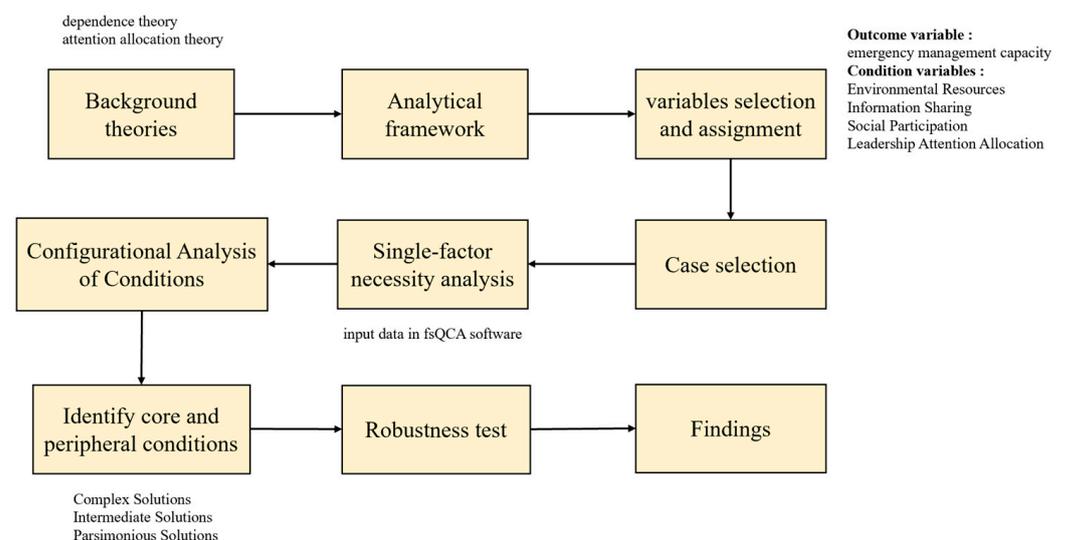


Figure 3. Steps of the fsQCA method (adapted from Ruyi Shi [28] and Ilias O [49]).

3.2. Measurements and Calibration

The emergency management effectiveness of government operations can vary significantly across different levels and sectors, influencing the overall outcome of emergency response and mitigation efforts. Based on the research framework, this paper investigates

the determinants of local urban governments' emergency management capacity in the Chinese context and their potential enhancement pathways.

3.2.1. Outcome Variable

The outcome variable in this study is the capacity of local governments to manage various types of emergencies. Research has shown that there are significant differences in crisis management and recovery between well-prepared and ill-prepared organizations [51]. Government emergency management capacity itself is a composite concept that includes the four capacities of preparedness, response, mitigation, and recovery [52]. Scholars have different opinions on the definition and composition of the government's emergency management capacity, but it is generally agreed that emergency management capacity is a process in which multiple subjects are coupled with each other, and that improving the government's emergency management capacity is an effective way to reduce the harm of emergencies and requires strengthening its evaluation on this basis. Currently, emergency management capacity assessment models are mainly divided into two categories: one is the indicator-based assessment model, which evaluates emergency management capacity based on multiple indicators; the other is to evaluate emergency management by dividing it into four stages.

The United States was the first country in the world to conduct an evaluation of the government's emergency management capacity. James [53] proposed a model for evaluating the emergency management capacity of the United States, and evaluated the emergency management capacity of American states in 1997 by using the Capability Assessment of Emergency Response (CAR) process, which focuses on 13 managerial functions in emergency management and consists of 1014 indicators. Wang [54] proposed an eight-indicator capacity assessment model, including leadership, resource management, information and communication, to be used by emergency management organizations to assess emergency management capacity. The activities and objectives of today's United States, and local emergency management agencies are based on the division of emergency management into four phases—mitigation, preparedness, response, and recovery, and the performance dimensions of the government's emergency management capabilities should focus on the four phases of prevention, early warning, disposal, and recovery from emergencies to carry out scientific assessment work [55,56]. The Law of the People's Republic of China on Emergency Response, which was promulgated in 2007, is based on the four phases of the development of emergencies, and provides for prevention and emergency preparedness, monitoring and early warning, emergency response and rescue, and post-event recovery and reconstruction.

The effectiveness of government emergency management is integral to the overall success in responding to and mitigating emergencies. The outcome variable for this study is the capacity of local governments to manage a variety of emergency situations. To evaluate this capacity, this paper synthesizes and refines past scholars' evaluation systems into three core analytical dimensions:

- **Early Warning and Hazard Prevention:** This dimension assesses the government's ability to provide early warnings and take preventive measures against potential hazards.
- **Timely Response After the Incident:** This dimension evaluates the government's response capabilities post-incident, focusing on the speed and effectiveness of the government's actions.
- **Post-Disaster Recovery and Reconstruction:** This dimension considers the government's efficiency and effectiveness in the aftermath of a disaster, including recovery and reconstruction efforts.

The outcome variable in this study is binary, with values of 0 and 1. It measures the government's overall performance in emergency management, capturing whether the government issues early warnings, takes preventive actions, and responds swiftly and effectively post-event without leading to more severe social impacts. A 0 represents that the government's emergency management capability is insufficient or the response is

unsuccessful, which is manifested in the following ways: a. failure to issue early warnings on time, leading to a lack of public awareness of precautionary measures, resulting in injuries, deaths, and property damage; b. failure to take effective precautionary measures, leading to the occurrence or expansion of the incident; c. slow response and ineffective measures after the incident, failing to effectively control the development of the situation.

A 1 represents the successful results of the government's emergency management capabilities, specifically manifested in a. the timely release of early warning, reminding the public to take precautions, effectively reducing casualties and property losses; b. effective preventive measures to reduce the probability of the incident or mitigate the extent of the incident after the incident occurred. The construction of outcome variables can provide a quantitative indicator for assessing the government's emergency management capability, helping the government to identify deficiencies in its emergency management efforts and take measures to improve them.

3.2.2. Condition Variables

The selection of condition variables is one of the key steps in QCA. It determines which factors will be examined by the study and how these factors will be measured. The selection of appropriate condition variables is crucial to the reliability and validity of the study results. Rihoux [57] provided directional guidance for condition selection, which is based on theoretical and empirical knowledge. Zhang [58] summarized five methods of condition selection on this basis by combing domestic and foreign QCA literature, which are the problem-oriented method, research framework method, theoretical perspective method, literature induction method, and phenomenon summarization method. These methods provide reasons for condition selection from different perspectives. Problem-oriented method refers to the fact that a study is precisely led by the research question, so some of the relevant condition variables are already included in the research question, and we can design the condition variables from the research question. The research framework method is based on the existing research framework to determine the conditions in the study. The theoretical perspective method refers to the formation of relevant conditions based on the same or different theoretical perspectives for a specific research problem. The literature method refers to summarizing the important conditions from the existing related literature or literature review. Phenomenal summarization means forming or obtaining conditions from the research phenomenon.

Compared with the literature approach, the phenomenon approach is mainly applicable to emerging phenomena. The problem-oriented approach and research framework approach emphasize the orientation of the research problem. The theoretical perspective approach focuses on the support of theory, and the literature and phenomenon approach emphasizes the accumulation of experience, so these five approaches can complement each other.

It is believed that the number of conditions in QCA research should be kept at an appropriate level; not more is better [57]. For example, when analyzing a medium sample (10–40 cases), it is generally recommended to select 4–6 condition variables. In research designs involving small samples, it is essential to limit the number of conditions to a minimal range. As conditions multiply, the potential variable combinations can quickly exceed the sample size, complicating the analysis. Hence, selecting a few critical conditions is advised to support parsimonious solutions. This approach emphasizes that fewer, more significant "causes" offer a clearer understanding of the phenomena under study, guiding us closer to uncovering the "core" factors indicative of causal mechanisms. Consequently, identifying the fundamental causes becomes more feasible. Therefore, we carefully balanced the number of cases against the need for concise analytical outcomes, aiming for clarity and precision in identifying causal relationships [58]. In this study, a total of 16 cases were collected. As shown in Table 1, the combination of the theoretical method and literature method was chosen to determine the four condition variables: environmental resources, social participation, information sharing, and leadership attention allocation.

Table 1. The methods of condition selection.

Method	Sources of Condition Variables	Conditional Variable
Problem-oriented	From the research question	
Research framework	From the existing research framework	
Theoretical perspective	From the theory	✓ Environmental Resources
Literature induction	From the past research literature	✓ Information Sharing Social Participation Leadership Attention Allocation
Phenomenon summarization	From the phenomena studied	

In qualitative comparative analysis, variables are distinguished as outcome variables and condition variables. The outcome variable is the phenomenon that the researcher is trying to explain, while the condition variables are the factors that influence the outcome variable. In addition, sub-variables are different dimensions of a variable that are used to measure the variable in more detail. Table 2 lists the definition and measurement of research variables.

Table 2. The definition and measurement of research variables.

	Definition	Measurement
Outcome variable		
Government’s emergency management capacity	The array of behavioral responses and management actions undertaken by local authorities and their associated departments during crises within a risk society.	Availability of early warning before a disaster and rapid response after a disaster.
Condition variables		
Environmental resources	Resource requirements of Governments in disaster response.	Financial resources/Human resources/Material resources.
Information sharing	Communication of information between the Government and the parties in the disaster response process.	Functionality and dynamism of the information exchange platforms.
Social participation	Degree of involvement of different actors in the disaster response process other than the Government.	Various actors in emergency responses.
Leadership attention allocation	Government leaders’ focus on emergencies.	The level of the leader/leaders’ response time.

This paper measures the adequacy of environmental resources at the time of emergencies from the three sub-variables of financial, human, and material resources. Financial resources refer to the funds that are indispensable to ensure rapid and smooth rescue in an emergency. Human resources refers to the personnel involved in emergency rescue, including professional rescuers and non-professional rescuers. Material resources refer to the equipment and substances used for rescue, etc. An information exchange platform refers to a platform that can exchange information needed in emergency rescue. If the information platform can release and upload relevant information about emergencies on time, it will ensure that all parties can obtain the latest information, leading to effective emergency response. This paper uses this information platform to measure the condition variable of information sharing.

This study measures the variable of public participation from the extent to which the public, experts, social organizations, and other social actors can participate in the rescue after an emergency. For major accidents, the government usually carries out inter-agency and cross-sectoral emergency response cooperation. Response time after an incident refers to the time it takes from the occurrence of the incident to the effective response of the government, including the activation of the emergency plan, the dispatch of rescue teams, etc. In this paper, we utilize the response time to measure leadership attention

allocation. To quantify the four condition variables, this paper utilizes relevant data, such as government websites and other online information, and assigns values to the contents of the four condition variables according to the variable definitions and assignment rules to establish a truth table. Assigning and analyzing these condition variables can help us better understand the influencing factors of the government's emergency management capability and provide references for improving it.

In this study, the condition variables are operationalized using ordinal values to create a four-tiered fuzzy set. These variables are integral to examining the degrees of association or membership of the conditions being studied. The values are assigned as follows: 1 represents full membership, indicating that the condition is fully present or applicable; 0.67 denotes substantial but not full membership, suggesting a significant presence of the condition; 0.33 signifies partial non-membership, where the condition is somewhat absent; and 0 indicates no membership, meaning the condition is entirely absent. This method of assigning values is consistent with the approach adopted by most researchers in the field, allowing for a nuanced analysis of the conditions' influences on the outcome variable [59]. In summary, based on the information we have about the case, the study selects the four-tiered fuzzy set proposed by Larkin [59].

Environmental Resources

In alignment with the resource dependency theory, environmental resources encompass the strategic capital, information, and knowledge assets that are crucial for enhancing organizational performance. In the context of emergency response, these resources typically entail financial, human, and material capital.

Financial security within this paper is assessed by the presence of a dedicated "emergency management fund" or the availability of financial resources earmarked for emergency management in the affected area. Human resources are evaluated based on the inclusion of both professional and common personnel ready for deployment during an emergency. Material resources are gauged by the availability and accessibility of emergency relief supplies, technical equipment, and necessary infrastructure during the rescue efforts.

The valuation of environmental resources is as follows: A value of 1 indicates that all three resource conditions—financial, human, and material—are fully met, reflecting an abundance of environmental resources. A value of 0.67 is assigned when any two of the conditions are satisfied, denoting a substantial level of environmental resources. A value of 0.33 is given when only one condition is met, suggesting a lower sufficiency of environmental resources. A value of 0 is assigned when none of the conditions are met, indicating a lack of sufficient environmental resources.

Information Sharing

Information sharing is pivotal among organizations with aligned goals but insufficient individual resources to achieve their objectives. Active interaction and cooperation become essential for attaining shared outcomes. Communication is a critical interactive process within emergency management, facilitating information exchange and bolstering cooperation and coordination among departments. The degree of information sharing is central to inter-departmental cooperation during urban emergency management, and its effectiveness is contingent on the quality and sophistication of the information platform utilized.

Given its significance, information sharing is considered a condition variable in this study. The values are assigned based on the functionality and dynamism of the information exchange platforms: A value of 1 is designated when multiple information exchange platforms are established and capable of being dynamically updated, indicating highly effective information transfer during emergencies. A value of 0.67 is allocated if information exchange platforms are established and can be updated, denoting relatively smooth information transfer. A value of 0.33 is given when information exchange platforms are in place but are not updated dynamically, suggesting somewhat impeded information flow. A

value of 0 is assigned when no information exchange platforms are established, reflecting a complete lack of information sharing.

Social Participation

This study regards social participation as a condition variable, drawing on insights from previous research and theories. It emphasizes the importance of inclusive participation in emergency response efforts, advocating for the engagement of the public, experts, social organizations, and other diverse subjects on an equitable basis. It is critical not only for these groups to be involved but also for them to play an active and effective role, providing substantial assistance in emergency situations.

Accordingly, this paper measures the level of participation by various actors—governments, the public, experts, and social organizations—in emergency responses: A value of 1 is assigned when all these groups—government, public, experts, and social organizations—are actively involved and their participation level is high, indicating a comprehensive and active social participation in emergency response. A value of 0.67 is designated when, in addition to the government's leadership, at least two other groups are actively involved in the emergency response, signifying a strong, albeit not complete, level of social participation. A value of 0.33 is allocated when the response is mainly government-led with minimal involvement from other groups, reflecting a low degree of social participation. A value of 0 is given when the government is the sole responder, and there is no active involvement from any other groups, indicating an absence of social participation in the emergency response.

Leadership Attention Allocation

The significance that a higher-level leadership assigns to an incident often influences the emergency response's urgency and effectiveness. This study assesses leadership attention allocation based on two principal factors derived from case analysis and incident reports in previous studies. Firstly, the rank of the instructing leader: The level of the leader who issues instructions or takes charge often signifies the degree of priority given to the emergency. A higher-ranking leader's involvement typically implies greater importance attached to the incident and, correspondingly, a more diligent response from subordinate departments. Secondly, government leaders' response time: The promptness with which leaders respond to an emergency and initiate rescue operations is pivotal. A quick response, especially from high-ranking officials, tends to indicate that the incident is taken seriously, which can be pivotal for a successful resolution [31]. The higher the rank of the leader who arrives at the scene to take command, the shorter the response time to the emergency, the more likely the incident will be taken seriously, and the more likely the disposal will be successful.

In this framework, leadership attention allocation is analyzed as the fourth condition variable. The degree of government attention to emergencies is inferred indirectly by measuring the response time interval following the onset of the emergency. The assumption is that a shorter response time reflects a higher level of local government concern for the emergency and, thus, a higher index of attention allocation. The valuation is as follows: A response time within 24 h is assigned a value of 1, indicating very high government attention to the emergency. A response time exceeding 24 h but within 48 h is given a value of 0.67, denoting high attention from the government. A response time exceeding 48 h but within 72 h receives a value of 0.33, suggesting low government attention to the emergency. Any response time exceeding 72 h is assigned a value of 0, indicating that the government does not consider the emergency a significant priority.

3.3. Case Selection

To ensure the reliability and relevance of the case selection, the following criteria were observed: (1) the cases should exhibit a certain level of similarity, sharing common background characteristics or attributes, which ensures that the results of the study are

generalizable and that common lessons can be extracted. Similarity ensures that the findings are somewhat generalizable and can distill common lessons and experiences; and (2) the cases should encompass diversity, representing various scenarios and features. This study takes the local government emergency management capacity as the research object and explores the factors affecting the local government's ability to realize a high level of emergency management. When selecting cases, the principle adopted in this study is not random selection in statistical sampling but obeys the typicality and theoretical sampling guidelines and is completed according to the theoretical construction and needs of the study. As this paper is to study the factors affecting the emergency management capacity of local governments under emergencies, it is necessary to select typical cases from the major emergencies that have occurred in China in recent years, which have all aroused a certain degree of discussion and concern at the time of their occurrence.

The following considerations were used to select cases for this study. Firstly, the selected cases occurred in recent years, specifically from 2015 to 2023, which means they share similar temporal backgrounds other than the condition variables. Secondly, the selected sample cases are released through official websites and news reports, including the official websites of the people's governments of the provinces and municipalities, the officially certified microblogging and other social media accounts of government agencies, and the People's Daily and other official media. These sources are more reliable and comprehensive. Thirdly, the selected cases spatially spanned across provinces and cities, so that it was easy to observe the capacities of different local governments. Fourthly, the cases should be universal and inspirational for the future development of emergency response collaboration, which requires that the cases have a wide range of impacts. Guided by these principles, 16 cases were chosen for the analysis. These cases are detailed in Table 3. The classification of cases is primarily based on the categorization of public emergencies defined in the National Overall Emergency Response Plan for Public Emergencies. This encompasses four types of emergencies: social security incidents (such as acts of violence), natural disasters (such as earthquakes, fires, floods, etc.), public health emergencies (like food safety concerns and infectious diseases), and man-made disasters (including traffic and industrial accidents).

Table 3. List of the 16 cases.

Serial Number	Typology	Case Study	Date of Occurrence
1	Social security incidents	Violent terrorist incident at the Kunming "3·01" railway station	March 2014
2		The "12·31" Shanghai Bund Stomp Incident	January 2015
3		Hebei Tangshan barbecue restaurant incident	August 2022
4	Natural disasters	Zhengzhou "7·20" torrential rain	July 2021
5		Tropical Storm Haikui	September 2023
6		Shenzhen "Mangosteen" Typhoon	September 2018
7		Sichuan Jiuzhaigou 7.0 magnitude earthquake	August 2017
8		The "6·23" Yancheng tornado incident	June 2016
9	Public health incidents	Jilin Changchun Changsheng vaccine incident	July 2018
10		Norovirus infection in Hefei, Anhui	March 2018
11		First case of H7N9 in Guangzhou	February 2015
12	Man-made disasters	"8·12" Tianjin Binhai New Area Explosion Incident	August 2015
13		"3·7" Fujian Quanzhou Xinjia Hotel Collapse Accident	March 2020
14		Chongqing Wanzhou Bus Falls into River	October 2018
15		The "6·1" Eastern Star Yangtze River Passenger Ship Sinking Incident	June 2015
16		The "3·21" particularly significant explosion in Xiangshui, Jiangsu Province	March 2019

3.4. Data Source

This study is an empirical study based on publicly available data. To ensure the accuracy of the results, we collected reports released from official government websites, thematic press conferences on emergencies, reports released by social media such as Weibo, and keyword searches of events on web pages. The investigation reports of emergencies are mainly the official investigation reports published by the Ministry of Emergency Management, the National Disaster Reduction Network, and other authorities in charge of emergencies. The thematic press conference of emergencies refers to the press conferences hosted by the local government to introduce emergency situations. We also searched for emergencies on Weibo and other online platforms so that we could obtain relevant information before and after the occurrence of the emergencies, which would provide the material for the subsequent assignment of the variables. After the collection of materials is completed, different researchers will analyze the cases by reading the relevant materials separately and code condition variables and outcome variables according to the operation steps of the QCA method. After the coding, the authors will cross-check the results together. When the assignment of values for all the cases is completed, the cases will be summarized, and the discrepant data will be fully discussed. During this period, the researchers will explain their reasons for the assignment, and finally, based on the results of the discussion, a consensus assignment will be reached.

How the government achieves a high level of emergency management capability is a complex issue, reflecting the coupling and linkage of various factors. This section briefly introduces the outcome variable, condition variables, and their assignment criteria. Next, we construct a case database, explain the sources of variable data, and lay the foundation for the subsequent analyses.

4. Results and Discussions

4.1. Single-Factor Necessity Analysis

In assessing the condition variables, two pivotal metrics are employed: consistency and coverage. Consistency quantifies the strength of the association between each individual condition variable—or their combinations—and the emergence of the outcome across all examined cases. As specified by Larkin, a condition variable is deemed necessary for the occurrence of the outcome if its consistency metric surpasses 0.9 [60]. This high consistency indicates that the condition is regularly present when the outcome is observed.

Coverage, on the other hand, determines the proportion of cases that exhibit a specific condition variable or set of variables relative to all cases that manifest the desired outcome. It serves to gauge the explanatory power of the condition variable(s) concerning the outcome. The closer the coverage metric is to 1, the more comprehensively the condition explains the presence of the outcome. Coverage, therefore, is indicative of the extent to which a condition variable or a combination of variables accounts for the outcome across cases.

The results displayed in Table 4, as analyzed using fsQCA3.0 software, provide insight into the necessary conditions for local governments to develop a high level of emergency management capacity. Within the four condition variables tested, “high leadership attention allocation” stands out with a consistency measure above 0.9. This indicates that it can be considered a necessary condition for fostering high emergency management capacity within local governments. Moreover, the coverage rate of this variable, at 77%, denotes that it has substantial explanatory power, suggesting that when “high leadership attention allocation” is present, a significant portion of the cases with successful emergency management outcomes can be explained.

Table 4. The results of single-factor necessity analysis.

Variable Name	Consistency	Coverage
Environmental resources	0.83	0.74
~ environmental resources	0.17	0.36
Information sharing	0.33	0.45
~information sharing	0.67	0.77
Social participation	0.57	0.68
~social participation	0.43	0.56
Leadership attention allocation	1.0	0.77
~Leadership attention allocation	0	0

Note: “~” indicates “No/Not”.

However, it is crucial to recognize that while “high leadership attention allocation” substantially influences the capacity for emergency management, it does not act as the sole determinant. High leadership attention allocation in isolation does not equate to guaranteed enhancement of emergency management capacity. The consistency measures for the other three factors—environmental resources, information sharing, and social participation—do not reach the threshold of 0.9, implying that none of these conditions independently are necessary determinants within the scope of this study.

Building upon the analysis of necessary conditions, the paper will next integrate all four condition variables into a fsQCA to explore the combined sets of conditions that lead to high levels of emergency management capacity in local governments. This approach will allow for the examination of how these conditions interact and whether their collective presence is associated with successful emergency management outcomes.

4.2. Configurational Analysis of Conditions

Before conducting the configurational analysis of conditions, it is necessary to set the case frequency and consistency threshold to ensure the reliability of the results. This study selected 16 cases, which is a small- to medium-sized sample. Referring to previous research by Schneider and Wagemann [61], this study sets the case frequency at 1 and the consistency threshold at 0.8. The method of sufficient condition configurational analysis involves examining the ways in which various condition variables can come together to explain an outcome variable. Within this analytical framework, three types of solution outcomes are generally recognized. Complex Solutions: These solutions take into account the full range of empirical evidence and logical deductions, including conditions that have not been empirically observed but could potentially exist within the data set. Parsimonious Solutions: These solutions identify the most streamlined set of conditions that are necessary across all analyzed cases, removing any non-essential elements. Intermediate Solutions: These solutions strike a balance between complex and parsimonious solutions, incorporating both empirical observations and certain theoretical assumptions about the data [62].

When analyzing the configuration of condition variables that consistently contribute to the outcome in both intermediate and parsimonious solutions are identified as “core conditions”. These conditions that appear only in intermediate solutions but not in parsimonious solutions are termed “edge conditions”. Core conditions indicate a strong causal relationship with the outcome and have a strong influence on the outcome, while edge conditions indicate a weak relationship with the outcome and have little influence on the outcome [62]. These may influence the outcome but are not indispensable.

Building on the intermediate solutions and their subsequent analysis, this paper employs fsQCA software to fine-tune the understanding of the configuration of factors that influence government emergency management capacity. These refined configurations, which serve as sufficient conditions for robust urban emergency management capacity, are systematically documented in Table 5, which clearly shows the relative importance of each condition variable in the configuration results. This table elucidates the configurations of

core and edge conditions that, when collectively present, correspond to a higher probability of effective emergency management by the government.

Table 5. The results of configurational analysis of conditions.

Variables	Path 1	Path 2
Environmental resources	●	●
Information sharing	⊗	
Social participation		●
Leadership attention allocation	●	●
Raw coverage	0.60	0.57
Unique coverage	0.20	0.17
Consistency	0.86	0.85
Coverage of solutions		0.77
Consistency of solutions		0.85

Note: ● means that the core condition exists; ⊗ means that the core condition does not exist.

As can be seen in Table 5, there are a total of two different configurations of conditions (often referred to as pathways) that can lead to the achievement of a high level of government emergency management capability. Larkin argues that the minimum value of consistency cannot be lower than 0.75 [59,63], which is also recognized by some other scholars [49,64]. It is worth noting that the consistency levels of path one, path two, and the overall solution in Table 5 are all above the minimum acceptable standard of 0.75, and the coverage meets the minimum standard of 0.50. This suggests that the configuration of conditions that includes all the cases in this study is a sufficient condition for the achievement of a high level of governmental emergency management capability, further suggesting that the results are more accurate. In addition, the coverage of 0.77 for the overall solution indicates that the two conditional configurations explain approximately 77% of the cases with high levels of emergency management capability, while the consistency of 0.85 indicates that the grouping analysis has a high level of explanatory power. Overall, the findings in Table 5 demonstrate the effectiveness of the identified condition configurations in elucidating the pathways that lead to high levels of government emergency management capacity.

4.2.1. Resource–Leadership Attention Pathway

Path 1: Environmental resources * ~Information sharing * Leadership attention allocation (“~” denotes a logical “not”, * denotes a logical “and”). Table 5 indicates that environmental resources, non-information sharing, and leadership attention allocation are all core conditions in Path 1. This indicates that in emergency situations when information exchange between government and non-governmental entities is obstructed, it is imperative for local governments to have access to ample environmental resources and secure focused attention from their leadership to ensure effective emergency management. Essentially, local governments need to act swiftly in the aftermath of an emergency. This approach highlights the crucial impact of both environmental resource allocation and the concentration of leadership attention, which we refer to as the “resource–leadership attention” pathway. This pathway underscores the significance of resource availability and directive leadership in navigating emergency situations successfully. The empirical data indicates that Path 1, with a raw coverage of 0.60, accounts for 60% of the instances of high emergency management capability, signifying that this configuration of conditions can explain a substantial proportion of successful outcomes. The unique coverage of 0.20 reveals that this path exclusively explains 20% of the successful cases, highlighting its distinct contribution to emergency management outcomes. A representative instance of Path 1 is Case 10, involving collective diarrhea symptoms among passengers on a flight from Bangkok to Hefei, Anhui Province. The Anhui Entry–Exit Inspection and Quarantine Bureau promptly detected the issue and activated a tiered public health emergency response. They notified the Provincial Public Health Emergency Response Headquarters, provided immediate

medical attention to those infected, traced the contact history, and dispatched viral samples for medical testing. This prompt and informed response led to the identification of the viral source and the successful containment of the outbreak.

4.2.2. Social Participation–Resource Coordination Pathway

Path 2: Environmental resources * Social participation * Leadership attention allocation (“~” denotes a logical “not”, * denotes a logical “and”). Table 5 shows that environmental resources, social participation, and leadership attention all serve as core conditions in Path 2. This suggests that effective emergency management can be achieved by local governments if they promptly respond after an emergency, possess adequate environmental resources for rescue operations, and actively involve various societal stakeholders, irrespective of other prevailing conditions. Path 2, in contrast to Path 1, underscores the critical role and necessity of social participation. In certain emergencies, governmental efforts alone might not suffice for an effective response. Hence, it becomes essential for governments to actively gather resources from diverse societal sectors, engage and mobilize all community stakeholders in rescue endeavors, and foster a collaborative approach to manage emergencies collectively. This collaborative effort aims to minimize casualties and property damage and prevent the escalation of the situation. We define Path 2 as the “Social participation–resource coordination” approach, where “coordination” denotes the heightened attention and involvement of leadership in emergency situations, along with the centralized command and coordination of emergency operations. The data analysis for Path 2 reveals a raw coverage of 0.57, indicating that this particular combination of conditions can explain roughly 57% of the cases where high levels of government emergency management capacity are observed. The unique coverage of 0.17 denotes that this pathway exclusively accounts for about 17% of the high-capability cases, highlighting its distinct role in the emergency management process. A representative example of this pathway is Case 1, involving an earthquake in the high mountain valley area of Jiuzhaigou. The location of this case is difficult to access, and the terrain is complicated, which makes it impossible for the rescue teams dispatched by the government to arrive in the first instance. Under such circumstances, the public needs to carry out self-rescue and mutual aid in the first instance and wait for the arrival of rescue teams. After the earthquake, the Sichuan Military Region established immediate communication with the Jiuzhaigou Armed Forces Department using satellite phones to ascertain the details of the disaster. Concurrently, medical and rescue teams from Aba Prefecture, Mianyang Municipality, and surrounding counties were rapidly dispatched to the affected area. The Sichuan Red Cross switched to emergency mode, coordinated with local branches to gather information, and maintained a 24-h rescue hotline. Furthermore, tourists trapped by the earthquake actively engaged in self-rescue and mutual aid efforts, which effectively minimized casualties. This case exemplifies a situation where the collaborative efforts of military, governmental, and civilian actors, underpinned by strong leadership and resource allocation, contribute to a successful emergency management outcome.

4.3. Robustness Test

The robustness test is an important analytical step in research utilizing the QCA method. This study draws upon the research of Schneider and Wagemann [61], employing a method of adjusting consistency levels for robustness testing, raising the consistency threshold to 0.8 and 0.85, respectively. Through repeated calculations using the fsQCA software, it was observed that there were no significant changes in the analytical results, including configuration counts, coverage, consistency, and output paths, thereby demonstrating the robustness of the conclusions drawn in this study.

The analyses in this section indicate that “leadership attention allocation” is a necessary condition for local governments to achieve a high level of emergency management capacity. “Resource–leadership attention” and “Social participation–resource coordination” are the

driving paths for the improvement of emergency management capacity. The robustness test verifies the robustness of the research results.

5. Conclusions and Agenda for Further Studies

Based on previous research, this study proposes four key condition variables affecting the emergency management capacity of local governments from the perspectives of resource dependence theory and attention allocation theory. They are environmental resources, information sharing, social participation, and leadership attention allocation. It is found that leadership attention allocation is a necessary condition for the government to demonstrate a high level of emergency management capability after an emergency occurs. Different from the previous literature highlighting a single factor, this study adopts the fsQCA method to analyze the effects of configurational effects of factors on government emergency management capability, providing a new explanation for the study of the factors influencing the emergency management capability of local governments. The results of the study can better guide the government's emergency response process and improve its efficiency. The key conclusions are as follows:

- (1) The level of leadership attention allocation generally represents a necessary condition for a high level of government emergency management capacity. The other three conditions—environmental resources, information sharing, and social participation—do not independently determine the government's capacity for emergency management.
- (2) Two primary pathways affecting emergency management capacity were identified in the analyzed cases: the “resource–leadership attention type” and the “social participation–resource coordination type”. The capacity of a government to manage emergencies effectively is contingent upon a synergistic effect of multiple factors. For instance, even if communication is not smooth due to information occlusion, the government can still enhance its emergency management capacity by mobilizing societal forces for participation in rescue efforts, provided that there are sufficient environmental resources available.

These conclusions contribute to a nuanced understanding of the complexities of emergency management and emphasize the need for a multifaceted approach that includes robust leadership attention, active social involvement, and the strategic utilization of resources. In light of the challenges faced by local governments in China in terms of resource allocation, lagging information sharing, and low engagement from various social actors in emergency management, this paper proposes two specific policy recommendations based on the identified pathways to enhance the emergency management capacity of local governments:

- (1) Mobilize Social Participation in Emergency Response: Governments should actively encourage the participation of multiple social actors in managing emergencies. Given the diverse and complex nature of emergencies, it is vital to develop the adaptive capacity of each entity to effectively respond to changing situations. This involves enabling them to quickly identify crises and work synergistically with the government. Increasing citizen participation is also critical. Individuals should be educated in emergency response skills, fostering a culture of self-help and mutual aid. Social organizations should address issues such as poor organizational management and lack of professional skills to become more effective participants in emergency management. Although social participation is very important in emergency management, we should also be soberly aware that at this stage, social participation in emergency management still faces many challenges. First, there is insufficient policy and legal support. The current policy and legal system for social participation in emergency management is vague, resulting in poor collaboration between the government and social forces, which requires further clarification of the relationship between the government and social forces from a legislative perspective. Secondly, addressing the challenges of self-regulation and oversight remains an unresolved issue that warrants deeper analysis. Understanding the underlying causes of these challenges is crucial for developing

an effective regulatory framework. Such a framework is essential to enhance the contribution of social forces, ensuring they can exert a more significant impact. By carefully constructing a comprehensive regulatory mechanism, we can facilitate a more robust participation of social entities, thereby leveraging their potential to address and manage various issues more effectively.

- (2) The integration of resources for emergencies, including financial resources, human resources, and other material resources, is an important premise for effective emergency response. Therefore, the emergency management system relies on these three aspects. Financial resources provide essential financial support for various emergency actions. The government needs to prepare the budget for emergency expenditure carefully. At the same time, local governments should expand the sources of emergency financial resources and establish diversified channels for donation to gain support from other social entities. Human resources are crucial for the realization of emergency response activities. Governments at all levels need to cultivate and introduce professional talents to build a high-level emergency response team. In terms of material resources, local governments need to set up emergency material procurement and management programs. Digital platforms are also encouraged to be utilized to realize the scientific deployment of materials. The reality is that the supply of and demand for various types of emergency resources varies significantly from one region to another, depending on a number of factors. For example, a certain type of resource that is extremely abundant in one region may be in extremely short supply in another region. Therefore, it is particularly important to fully integrate the existing resources available within and outside the region, to maximize the efficiency of resource utilization and allocation, and to achieve mutual sharing and optimal allocation of emergency resources among different regions, given the imbalance in the storage, supply, and demand of emergency resources among different regions.

In this paper, although four types of emergencies have been selected to identify the factors affecting the emergency management capacity of local governments, there are still some limitations that should be further investigated in future research. Firstly, the factors affecting the government's emergency management capacity are complex. Although this study draws on the relevant studies to choose the conditional variables, it is difficult to completely cover all of its influencing elements due to the limitation of the number of variables restricted in fsQCA methods. In terms of case selection, this paper has chosen 16 typical cases for analysis, which are somewhat representative. However, because of the multitude of diverse and varying degrees of risk in real-life emergencies, more cases in different institutional contexts should be studied in future studies. Secondly, although the authors adopted cross-checking in the coding process, the coding of the variables should be further testified in future studies as the sample of QCA is also limited. Therefore, subsequent studies can refine the assignment rules of the outcome variables to more accurately reflect the government's emergency management capability. In future research, researchers can explore and compare the emergency management capabilities of local governments in different phases of emergencies and in different political and cultural contexts to supplement the findings found in this study.

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