Chapter 1

WENCHUAN EARTHQUAKE OVERVIEW

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Natural catastrophe has seemingly become a part of our daily lives as news that a natural disaster has taken place somewhere in the world has become all too commonplace. Earthquakes in particular inhabit a special position within the array of natural hazards against which humanity perseveres because they can result in some of the most devastating losses of life and property and critically disrupt and delay economic development. Especially worrisome is the rising trend seen since the 1970s in the number of earthquakes causing significant human and economic loss (Guha-Sapir and Vos 2011). Unfortunately, this worrisome trend is expected to continue as urbanization progresses and as global exposure (though not necessarily vulnerability) to disaster risk expands. As of 2009, the number of people living in cities exposed to earthquakes was approximately 370 million worldwide, a number that is expected to more than double by 2050 (Lall and Deichmann 2009).

China is no stranger to natural disaster, or to earthquakes in particular, because half of its territory consists of high-intensity earthquake regions (Yu et al. 2010). Although China already contends with a staggering variety and frequency of severe natural disasters, in part due to its rapid economic development in recent decades, continued development, along with the onset of global climate change (Zou and Yuan 2010), is expected to increase China's exposure and is considered to pose additional threats. Although China's exposure to natural disasters has increased because of its recent development and urbanization, disaster management has figured prominently in Chinese governance throughout its long history, perhaps most famously as a means of confirming or denying the emperor's Mandate of Heaven, or divine right to rule, which was perceived to have been withdrawn when natural disasters occurred.

Nonetheless, the physical and social impact of the Wenchuan earthquake was devastating. On May 12, 2008, the earthquake, which according to the China Seismological Bureau registered 8.0 on the Richter scale (CCTV 2008), shook the nation as the most severe earthquake, in terms

of sheer magnitude, to strike modern China since its founding in 1949. Its tremors resulted in the deaths and disappearances of nearly 90,000 people (Xinhua, 2009), more than 5,000 of whom were schoolchildren (Bai et al. 2009), and RMB 845 billion in direct economic losses (Xinhua 2008). Ultimately, the total disaster area covered 500,000 square kilometers with the quake's destruction extending, to a varying extent, across 10 provinces, autonomous regions, and direct-controlled municipalities: Sichuan, Gansu, Shaanxi, Chongqing, Yunnan, Hubei, Guizhou, Henan, Shanxi, and Hunan (China, Ministry of Civil Affairs, NCDR and UNDP 2009). The quake's tremors could be felt in neighboring countries and in cities as distant as Beijing—1,545 kilometers away (BBC 2008). Ultimately, the disaster affected more than 46 million people, and its social impacts ranged from homelessness to loss of livelihood to post-traumatic stress disorder and other trauma-related psychological disorders (China, Ministry of Civil Affairs, NCDR and UNDP 2009). However, the staggering scale of the damage and destruction of the quake was met with quick and aggressive responses by public, private, and nonprofit actors.

In launching relief and rescue efforts, national and local authorities faced overwhelming obstacles such as the mountainous and remote terrain and the disrupted telecommunications and transportation infrastructure as well as a lack of readily available equipment and supplies. At the national level, the central government promptly enacted a number of organizational measures to initiate disaster response, including the same-day establishment of the State Council Earthquake Rescue and Relief Headquarters, commanded by Premier Wen Jiabao, who personally traveled to the disaster area that afternoon. The State Council Earthquake Rescue and Relief Headquarters in turn formed and oversaw nine subordinate working groups: (1) the Headquarters of the General Staff of the Chinese People's Liberation Army rescue and relief group, (2) the Ministry of Civil Affairs public livelihood support group, (3) the China Earthquake Administration earthquake monitoring group, (4) the Ministry of Health epidemic control group, (5) the Publicity Department of the CPC Central Committee publicity group, (6) the Ministry of Industry and Information Technology production restoration group, (7) the National Development and Reform Commission infrastructure assurance and post-disaster reconstruction group, (8) the Ministry of Water Resources water administration group, and (9) the Ministry of Public Security social security group. At the local and provincial levels, the Sichuan provincial government established the 512 earthquake relief command headquarters (which also formed and coordinated the efforts of various

working groups), while key disaster relief bodies were set up in some cities, autonomous prefectures, and counties (China, Ministry of Civil Affairs, NCDR and UNDP 2009).

The Chinese government also established the Regulations on Post-Wenchuan Earthquake Rehabilitation and Reconstruction on June 8, 2008 (China, State Council 2008a), to facilitate and hasten the country's "return to normalcy" (UNESCAP CDR 2008a). Building off of China's already comprehensive set of disaster laws and regulations (including the Law on Earthquake Preparedness and Disaster Reduction, the National Master Plan for Responding to Public Emergencies, five national thematic disaster response plans, and emergency response plans for 15 central government departments), the Regulations on Post-Wenchuan Earthquake Rehabilitation and Reconstruction outlined the following priorities, strategies, and measures:

- People-oriented actions to ensure a safer environment
- Scientifically sound and comprehensive planning
- Phase-by-phase implementation
- A joint-funding mechanism that combined self-reliance, government subsidies, and social donation assistance
- A survey to assess the losses and estimate the costs of rehabilitation and reconstruction
- A comprehensive assistance scheme that paired 19 provincial administrations with 19 counties in the earthquake zone

Following the establishment of the regulations, the government released the State Overall Plan for Post-Wenchuan Earthquake Restoration and Reconstruction (China, NDRC 2008). The plan allocated nearly RMB 1 trillion to the reconstruction of 51 seriously hit counties in Sichuan, Gansu, and Shaanxi. Because the affected region was characterized by great risk of secondary disasters, diverse levels of development, and the presence of world cultural and natural heritage sites and reserves, as well as of ethnic minority settlements, the plan grouped areas for reconstruction into three categories.

First, areas with lower disaster risk and greater carrying capacity were categorized as suitable for urbanization and industrialization. Second, areas with greater disaster risk and less carrying capacity were targeted for appropriate urban reconstruction and the development of select industries. Third, ecologically significant areas with low carrying capacity, great disaster risk, and

prohibitive construction costs and conditions were designated to accommodate small scattered populations and to shelter natural and cultural resources. The approach for the third category also involved relocation. In this way, the government sought to efficiently allocate its considerable though finite reconstruction resources.

World Bank officials commended "the speed and efficiency with which the Chinese government was able to mobilize government agencies, the private sector and the population at large" (Argueta-Bernal and Procee 2012). Other observers cited favorably the cooperative attitude toward foreign journalists and foreign aid (*The Economist* 2008). In addition to the government's efforts, private companies donated record levels of aid to the rescue effort (Sarkis, Ni, and Zhu 2011). The tragedy also served as a watershed moment for China's civil society, inspiring unprecedented numbers of Chinese citizens to volunteer their time and to donate their money (Shieh and Deng 2011; Teets 2009).

In the event of an earthquake, however, China's hierarchical society and top-down governance structure (Zhang 2006) also faces a challenge in effectively delivering the massive aid and rebuilding the disaster areas, for multiple reasons. If some of the government buildings were to be damaged or if the civil service were to suffer casualties, the local government's capacity, which would be a critical resource during such a time of crisis, would need to be rebuilt, a daunting task. Also, there exists widespread information asymmetry between the different levels of government. As there are large differences in needs across counties and villages, it is a great challenge, for the central government faces a challenge to quickly obtain accurate information about the degree of damage and the resources necessary for recovery in the various disaster areas.

Nevertheless, China's disaster management efforts following the 2008 Wenchuan earthquake gained significant international recognition. Central to this achievement was China's willingness to critically appraise existing disaster management strategies and to explore innovative approaches. This book explores key innovations in China's response to the Wenchuan earthquake by presenting firsthand accounts of the policymakers who oversaw major paradigm shifts in disaster management strategies, as well as the research of leading experts.

History of China's Disaster Management System

China's disaster management system went through three distinct stages, identified by Zhang, Lu, and Zhang (2011).

Stage 1: Founding of People's Republic of China to SARS (1949 to 2003)

The first stage of modern China's disaster management system was characterized by the strong role of the central government: nearly all disaster management functions were performed via top-down political mobilization and centralized post-disaster command, and grassroots social organizational capacity was insufficient. Consequently, the central government emerged as the leading player in disaster relief, while the contribution of local governments and civil society was negligible. Moreover, in its approach to disaster management, the central government attached overwhelming importance to the direct economic damages and losses caused by natural disasters, while the social impacts were simply ignored.

A number of major legislative and policy developments took place during this first stage. At the end of 1949, a national disaster reduction and relief system was established by the Government Administration Council of the central people's government, centered around the Ministry of Internal Affairs (predecessor to the current Ministry of Civil Affairs). Later, in 1950, the Central Disaster Relief Commission was established to create a specialized office within the Ministry of Internal Affairs to oversee disaster management. Later, the disaster management system was redesigned so that the management of individual disasters was assigned to specific departments according to the type of disaster involved. For example, the Ministry of Water Resources was responsible for flood control, while the Seismological Bureau was responsible for coping with earthquakes.

In 1951 the Notice on Uniform Standards for Disaster Statistics was issued by the Central Manufacture Disaster Relief Commission. At the First National Civil Affairs Conference in 1950, it was proposed that China's disaster relief policy be defined as "pulling through by hard working, resource saving, mutual assistance, work relief and other necessary relief" (Li 2007). Improvement of the disaster management system, however, largely came to a halt during the Cultural Revolution. Unfortunately, during this period China suffered two of the greatest disasters of its modern period, the famine associated with the Great Leap Forward (1959–1961) and the Tangshan earthquake (1976).

The number of casualties caused by the famine is still being debated; estimates range from 10 to 30 million (Xia and Kang 2001; Cong 1989; Li 1998; Kane 1993; Li 2012). In order to explain the extensive loss of lives during the Great Leap Forward, President Liu Shaoqi (1959–1968) said, "*sanfentianzai, qifenrenhuo,*" which translates to "30 percent natural disaster, 70 percent

man-made disaster," and points to the occurrence of a natural disaster (in this case drought) during a period of both policy incompetence and social chaos (Liu 1991). The Tangshan earthquake, which caused 242,419 deaths, highlighted a number of lessons. For example, although the city was located in a high-intensity disaster zone, it was designed to withstand earthquakes of only magnitude 6.0 on the Richter scale, far short of what the city needed to withstand the magnitude 8.0 earthquake that struck in 1976. Also, the emphasis during that time on ideological struggle rather than on the pursuit of scientific fact hampered China's disaster management capacity (Xia and Kang 2001).

As a result of the reform and opening up in 1978, China's rapid development led to increased exposure, both in terms of frequency and severity, to natural disasters, epidemics, and industrial accidents. The old system in which specific departments were paired with specific types of disasters quickly became overwhelmed, leading to disaster management coordination failures among the various sectors. In response, an interdepartmental deliberation and coordination mechanism was built as part of a larger overhaul of the organization of government departments.

Under this new mechanism, various organizations were established by the State Council, including the National Disaster Reduction Committee, State Flood Control and Drought Relief Headquarters, Prevention Headquarters, China's National Nuclear Emergency Coordination Committee, and National Disaster Control and Relief Coordination Office, with many corresponding organs set up by governments at the provincial and lower levels as well. The organization of the local disaster relief organs generally reflected that of the central government's, with the National Disaster Reduction Committee acting as a coordinating organization and the Ministry of Civil Affairs taking responsibility for disaster-relief work. This structure was maintained until 1994 (after the 10th National Civil Affairs Conference), when a level-to-level management system (*fenqiguanli*) of disaster relief was instituted by the central and local governments, under which governments were responsible for providing relief for their own jurisdictions.

Stage 2: SARS to Wenchuan Earthquake (2003 to 2008)

The second stage of modern China's disaster management began in 2003, during the outbreak of severe acute respiratory syndrome (SARS), and came to a close in 2008 with the occurrence of the Wenchuan earthquake. After the onset of SARS, disaster management came to be viewed as fundamental to effective public governance, and the government took measures to build

an emergency management system focused on laying out plans, passing laws, establishing systems and mechanisms for emergency management, and completely replacing the traditional system that paired one department with one type of disaster.

Some major disaster management milestones were reached by the General Office of the State Council during this period. The Office set up a task force on proposing emergency plans (2003), drafted national-level emergency plans (2004), issued the national-level master plan and issued a policy to ask local governments to set up emergency management offices at each level of government and draft contingency plans (2005), issued a policy to ask enterprises to draft their own contingency plans (2006), and facilitated local governments' delivery of capacity building to communities (2007) (Hua 2007).

By the end of 2007, the effort to complete the new emergency management system—centered on the construction of plans, laws, systems, and mechanisms for emergency management—was nearly complete (Shan 2012). The effort included the preparation and issuance of the Master State Plan for Rapid Response to Public Emergencies and a comprehensive emergency plan system that encompassed that plan, the special state plans for responses to specific emergencies, departmental emergency plans, local emergency plans, and emergency plans for enterprises and public institutions (Shan and Zhou 2008). Additionally, the number of emergency management plans of all types and at all levels of government grew from 106 to 1.3 million, illustrating the growing importance of emergency management across all levels of government.

Provincial leading organs for emergency management were set up in all 31 provinces, autonomous regions, and municipalities, and special functional organs for emergency management were strengthened, including those for state flood control and drought relief, earthquake resistance and hazard mitigation, maritime search and rescue, forest fire prevention, disaster relief, and production safety.

Various emergency management mechanisms were constructed. These included emergency monitoring and early-warning mechanisms, communication mechanisms, emergency decisionmaking and coordinating mechanisms, responsibility and response mechanisms on a level-to-level basis, social-mobilization mechanisms, emergency resources allocation and requisition mechanisms, incentive structures, an integrated public security system, a comprehensive community management system, a new system to coordinate interactions between government and civil society, and international coordination mechanisms (Gao 2008).

Also, the Law of Response to Public Emergencies of the People's Republic of China, China's first basic law for emergency management, was passed by the Standing Committee of the National People's Congress on August 30, 2007, and was officially implemented on November 1, 2007 (China, National People's Congress Standing Committee 2007). This marked the legalization of emergency management. The law effectively established the legal system for emergency management (Mo and Xiao 2009). In addition, it introduced preparedness and prevention into the disaster management system (Qi 2007). Further, the law provided a horizontal linkage among the various ministries and encouraged the local governments to assume a more prominent role as first responders. Finally, the law formally extended the scope of disaster management planning to cover a wide array of sectors. This resulted in the promulgation of 35 laws, 37 administrative regulations, 55 departmental rules, and 111 regulatory documents for responding to public emergencies (China, Legislative Affairs Office of the State Council 2007).

Moreover, instead of relying heavily on functional and temporary organizations during this stage, the government created facilitating organizations designed to encourage different agencies to cross traditional bureaucratic boundaries and to cooperate. The government also leveraged both permanent and temporary organizations. As part of this transition away from the traditional response system to a diversified long-term and preventive system, the key role was gradually shifted from the state to the society.

As a result, disaster management was less restricted to state action and was gradually diffused throughout the rest of society, including township governments, communities, private enterprises and public institutions, social groups, and volunteer teams. The Master State Plan for Rapid Response to Public Emergencies stated that, under the leadership of the Central Committee of the CPC and the State Council, the emergency management system should be distributed under both vertical and horizontal management, with responsibilities taken on a level-to-level basis.

Except for government agencies, participation in the relief work was limited to government-organized nongovernmental organizations (GONGOs), such as the China Charity Federation (CCF), China Association of Social Workers (CASW), Red Cross Society of China (RCSC), and China Women's Development Foundation (CWDF). Grassroots organizations were largely unengaged, despite the participation of Friends of Facilitators in the relief work. Furthermore, volunteers and donations were not effectively leveraged because of the underdevelopment of organized channels extending beyond the existing system (Zhan 2008).

Stage 3: Wenchuan Earthquake to Present (2008 to Present)

The third and current stage of modern China's disaster management development began with the Wenchuan earthquake in 2008. Although the government was commended by a number of external observers (for example, *The Economist* 2008) for its response to the Wenchuan earthquake, the disaster revealed the need for additional collaborative mechanisms designed either to link the central government, local governments, and social departments together via laws and regulations or to realize the legalization of emergency management, the localization of decisionmaking processes, and the socialization of the disaster response structure. Major policy innovations of this period that continue in this tradition of diffusion, both in terms of time (Chapter 5) and policy space (Chapters 3 and 4), are the focus of this report.

Summary of Chapters

Given the current and future stakes involved, the urgency of addressing the common threat posed by natural disasters—especially by earthquakes—is starkly clear. However, those exposed to the threats posed by earthquakes are united not only by their vulnerability but also by their ability to learn from one another, transfer and adapt best practices, and collaborate on novel solutions. It is in this spirit that we present some of the most inspired recent innovations in disaster management born of China's experience during the 2008 Wenchuan earthquake.

In order to provide a comprehensive survey of China's disaster management innovations during and following the Wenchuan earthquake, this book spans the three main phases of China's disaster management policy—namely prevention and mitigation before the disaster, response and rescue immediately following the disaster, and reconstruction in the wake of the disaster—over the following several years.

In Chapter 2 the authors use a unique dataset to examine the effects of the 2008 Sichuan earthquake on the income and expenditure levels of rural households. They find that living subsidies were adequate to offset losses in annual income, but the mix of aid and bank loans were not sufficient to cover all reconstruction costs. In Chapter 3, the author presents his experience coordinating the pair-wise aid policy, describing the difficult conditions that led to its inception and the process of implementing the program as well as insights on its drawbacks and future development.

In Chapter 4, the author discusses the role for social innovation in disaster management by first reviewing the cross-sector collaborations that occurred during the response to the Wenchuan earthquake. He then discusses the challenges faced by the government during the response, the opportunities and innovative solutions involved, and the political considerations, such as the relationship between the central and local governments, involved.

In Chapter 5, the authors recount China's recent efforts at connecting disaster management to poverty reduction, the effectiveness of these efforts, and opportunities for better integrating these priorities. Chapter 6 presents conclusions, key findings and policy trends, and issues for further research.