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# What did China Learn from Disasters? Evolution of the Emergency Management System after SARS, Southern Snowstorm, and Wenchuan Earthquake

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**ABSTRACT** *Lessons from the SARS Epidemic, Southern Snowstorm, and Wenchuan Earthquake led to a second generation disaster management policy framework by integrating different components and building emergency capacity in terms of problem solving. However, some policy changes, like broadening the focus to include multiple disaster types, extending the emergency life cycle, and establishing professional rescue teams, are effective in clarifying responsibility, developing institutional procedures, and enabling faster and more professional response, while other policy changes are not effective due to the structural constraints of China's political system.*

## Introduction

The response to, and recovery from, the Wenchuan Earthquake in 2008 revealed that China had preliminarily established an effective emergency management system, which had made significant progress compared to the poor handling of the SARS epidemic in 2003. Behind the improved performance are changes in policies. Why did China make tremendous changes in its emergency management policies? Was it because of the lessons learned from disasters? Were the new policies effective when they were examined in the following disasters? If not, why not, and where can we improve?

## The Chinese Political System and the First Generation Disaster Management System

China is a one-party political system with a top-down central government, having three major characteristics:

1. The government includes not only the administrative system, but also the Communist Party of China (CPC), which makes decisions, nominating officials

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and commanding the military forces, while the administrative system is responsible for the execution of decisions under the leadership of the CPC only.

2. All officials are designated by the CPC at the same or higher level, so the lower levels of government are responsible to the higher authorities. There are four administrative levels: "state province municipal county" from central to local. At the bottom, rural villages and city communities are led by higher level authorities rather than enjoying self-governance.
3. The higher level governments are strong and robust with an ability to gather resources. They are aware of the development of non-governmental organizations (NGOs) and impose strict regulations on their registration. Under these circumstances civil society malfunctions, and there is seldom cooperation between the government and civil society.

The political system determines the characteristics of disaster management. Since the 1950s, several catastrophes have occurred, such as the Tangshan Earthquake in 1978 and the Yangtze River Floods in 1998, but the central government ultimately coped with them. As a result, it seemed beneficial for central government to make revisions to the traditional disaster management system, instead of creating a new one. During this period, China established eight branches of government that have major duties in coping with disasters. Besides the Civil Affairs departments, which managed relief operations in each disaster, the other seven branches include: meteorology, water resources, agriculture, forestry, earthquakes, marine, and geological mining. These branches cope separately in their own ways with the disasters for which they have responsibility. In the traditional system, management of natural disasters was accorded more importance ~~for its frequency and damage~~, as well as due to external pressures. In 1990, the United Nations proposed the International Decade for Natural Disaster Reduction to help developing countries to reduce natural disaster risk. China joined this program and established the National Committee for Disaster Reduction, which served as a coordinating organization at the state level to improve cooperation among different departments and agencies.

The first generation disaster management system paid more attention to incidents generated by natural disasters. Although industrial accidents and epidemics happened occasionally, the central government set up the Center for Disease Control and the State Administration of Work Safety at the central level. Most of the departments only had responsibilities for managing natural disasters, and they dealt separately with different types of natural disasters (Zhang and Tong 2009a). However, three recent major disasters SARS, the Southern Snowstorm, and the Wenchuan Earthquake led to a new disaster management framework and built emergency capacity in terms of problem solving across types of disasters.

## **SARS in 2003: Initiation of a New Framework for Disaster Management**

### *Case 1: SARS in 2003*

On November 16, 2002, the first case of SARS (Severe Acute Respiratory Syndrome) was reported in Foshan city, Guangdong province. The number of reported cases suddenly increased in the following several months, and the World Health

Organization (WHO) declared health alerts for travelers to Guangdong province and Beijing city. On April 20, 2003, the China State Council held a news conference to admit that the number of cases had been willfully hidden and under-evaluated, and promised to release the number of cases daily. After that, China's government began to address the problem and took effective and open actions to quarantine the affected patients and prevent the spread of SARS. On June 24, 2003, the WHO canceled the warning to travelers and removed Beijing from the list of epidemic areas. 95 100

The poor handling of SARS exposed serious problems in disaster management:

1. Restricted definition of disaster. Only natural disasters were included, and experience from natural disaster management could not be applied to epidemics. 105
2. Unclear definition of roles and responsibilities of governments and their departments and agencies at various levels. As a result, it was unclear who should be responsible for the disasters.
3. Lack of transparent information flow. Governments were used to keeping information regarding disasters secret, and this practice resulted in misjudgment of the situation and erroneous decision making. 110
4. Ignorance of the other three aspects of disaster management: disaster preparedness and prevention; monitoring and early warning; rehabilitation and reconstruction. Consequently, the Chinese government failed to prevent SARS, initially a disaster at the community level, from escalating to the national level. 115

The poor handling of SARS in the initial stage created a serious crisis for China's government in terms of damage to social order, political trust, and international reputation. Compared with the management of previous disasters like the response to the Yangtze River Flood in 1998, the external and internal environments both changed greatly. With rapid globalization, the failure of disaster management generated more outward pressure on China, given that China had joined the World Trade Organization (WTO) in 2001. In later policy adjustments in response to SARS, pressure from the WHO played a key role for China's government in changing its way of coping with the epidemic. Along with improved national power, China needs to maintain its international image if it wants to act as one of the leading countries in the world. Meanwhile, after 30 years of reform and opening up, China has made great economic progress, but reform of the political system has seriously lagged behind, and people expect an effective and responsible government. In this case, the new central government in 2003, which was dominated by President Hu Jintao and Premier Wen Jiabao, proposed the people-centered governance concept and policy orientation. Disaster management is a good breaking point, since after the shock of SARS people took a common-sense approach towards living more safely. Therefore, the Chinese central government decided to establish a new disaster management system instead of just amending the existing system, taking into consideration all kinds of disasters that caused approximately ¥600 billion per year in losses (People Net 2009). China's central government built an integrated framework for an emergency management system. As a consequence of SARS, China's central government tried to solve the problems exposed by taking the following actions: 120 125 130 135 140

1. Broadening the focus to multiple disaster types that include natural disasters, industrial accidents, public health incidents, and social disorder incidents. If the damage reached the minimum death toll or property loss set by the government, the natural disaster or incident could be declared an emergency, to which the governmental emergency management system is required to respond.
2. Clearly defining the roles and responsibilities of the government. In line with the governmental levels from top to bottom, like “state province municipal county”, disasters were set by four levels (I = catastrophic, II = severe, III = moderate, IV = mild), determined by the consequent level of damage. At each level, the administrative heads played the role of commanders, with the general secretaries serving as the coordinators, and departments and agencies differentiated in their responsibilities in emergency management based on their routine tasks. In order to enforce the responsibilities of local governments, the jurisdiction is required to respond immediately, no matter what the type or level of disaster.
3. Establishing a transparent information flow. Within each level of government, a report and delivery mechanism for emergency information was set up with time limits for action. For example, a level “I” disaster notification must be delivered from the jurisdiction to the state council within four hours. Moreover, the mechanism for making information open and releasing it to the public was set up in terms of declaring warnings, holding news conferences, nominating the spokesperson, and guaranteeing the rights of journalists to conduct interviews and broadcast news when disasters happen.
4. Completing the emergency life cycle by emphasizing the other three stages preparation and prevention, monitoring and early warning, and rehabilitation and reconstruction as well as relief and rescue. In order to enforce preparation and prevention, a full emergency plan system with millions of plans was set up within four years. By the end of 2006, from central to local, all departments and agencies, public institutions with duties in emergency management, and industrial enterprises above the designated size (i.e. all state-owned enterprises and those non-state-owned enterprises with an annual sales income over ¥5 million) had all made their own emergency plans (State Emergency Office 2007). Besides, urban communities and rural villages were required to develop their own emergency plans by the end of 2008. Meanwhile, the government established a color warning system that rated the warnings as red, orange, yellow, or blue, determined by the level of damage caused by the event.

These policy changes were legislated by the National Emergency Response Plan (NERP) issued on January 8, 2006, and the National Emergency Response Law (NERL) issued on December 1, 2007. Meanwhile, the accountability system for emergency management was primarily set up as an outcome of SARS. In April 2003, in order to make sure the local authorities could change their focus from economic business to dealing with SARS, China’s central government removed Zhang Wenkang, the Minister of Health, and Meng Xuenong, the Mayor of Beijing, from their positions, due to their delayed response. The accountability mechanism for managing public health incidents was first written into the Public Health Emergency Ordinance issued on April 20, 2003. It initiated the policy trails that established the



accountability system for local governments, with Tianjin, Changsha, and Chongqing specifying their accountability policies one after another (Tang 2007). Despite a few small differences, all of these policies would invoke the accountability procedures in case of: (1) concealing, falsely reporting, delaying or forging information on disasters; (2) not responding or delay in responding to natural disasters, accidents, or epidemics that caused serious damage or huge losses; (3) taking unlawful or improper administrative measures that caused large scale petitions, demonstrations, or social disorder (Zhang and Tong 2009b). With the setup of the emergency life cycle, the scope of administrative accountability was extended accordingly. The NERL explicitly stipulates that besides the above three cases, the administrative accountability of precaution and recovery should also be stressed: (1) failure to take protective measures in line with the provisions that cause a emergency or failure to take necessary protective actions that cause secondary or derivative incidents; (2) failure to release an emergency warning in time or take measures in the early warning period in line with relevant regulations that cause damage; (3) failure to organize promptly post-event work like self-rescue and recovery and rebuilding; (4) intercepting, appropriating, or privately dividing emergency funds and rescue materials; or (5) failure to return in a timely manner the expropriated property of organizations or individuals or to compensate the expropriated property without following the relevant provisions. In addition, the NERL has advanced the administrative responsibility of the accountability system to legal responsibility, upgrading provisional regulation to the state system. Before this, accountability was susceptible to being influenced by the political climate and the leader's will, which was sometimes harsh, and sometimes lax. The original administrative accountability system had been frequently altered, and this resulted in unstable implementation. Evidence from the years 2003–2006 revealed that punishment by dismissal accounted for 42 per cent of the sanctions used to hold administrative personnel accountable for actions taken or not taken in disaster events, while in 2006, the high season of accountability actions, this unexpectedly fell to 24 per cent (Song 2008).

Is the new emergency management system effective? It was soon tested by a catastrophe, and proved still to have flaws that needed to be improved.

### **Southern Snowstorm: An Examination of the New Policies**

#### *Case 2: Southern Snowstorm*

From January 10 to February 2, 2008, a large scale snowstorm struck the vast area of south China from west to east, and affected 19 provinces and over half of the Chinese people. Heavy snow continued, and frozen lines interrupted the transportation, water, and power supply lines. The information released on the website of the Ministry of Railways and Department of Transportation showed that, at the peak of the Southern Snowstorm, nearly 800,000 people were stranded at Guangzhou Railway Station, and 6,000 vehicles were blocked on Jingzhu Highway. In Guizhou Province, 3,895 power lines were damaged, 44 counties suffered from power failure for more than two weeks at the worst, and one-third of the population suffered from failure of water supply (Xinhua Net 2008). As the third catastrophe within ten years, an event that followed the Yangtze River Flood in 1998 and SARS

in 2003, the Southern Snowstorm caused 38 deaths, and a direct economic loss of approximately ¥100 billion.

Compared to disaster management before SARS, obvious progress was evident in the transparency of the information. China Central Television (CCTV) supplied 24-hour reporting of the disaster, and the government held press conferences to release information, so people could use TV, newspapers, and websites to follow the status of the disaster and emergency response actions taken. However, there were obvious problems:

1. Insufficient statutes for all types of hazards. Before the Southern Snowstorm, there was no plan for snowstorm emergency response in the southern provinces, which led to lack of preparation and response by local governments. Because the NERP was designed level by level from the top down due to the characteristics of the Chinese political system, it was assumed that it was unnecessary for southern provinces, municipalities, and counties to plan for snowstorm emergency response. Unfortunately, among the 25 specified plans for disaster at the state level, there was no plan for snowstorms.
2. Lack of training exercises, which resulted in failures in command and coordination between departments and agencies. The Southern Snowstorm happened in the period of the Chinese traditional Spring Festival, when hundreds of millions of migrant workers returned to their home towns. Obviously, an integrated mechanism to enable local governments, the Ministry of Railways, the Department of Transportation, and the State Meteorology Administration to work together should have been established to deal with such a disaster. However, the agencies responded separately. For example, the State Meteorology Administration declared an orange warning on January 8, but southern provinces like Hunan and Guizhou did not mobilize any response. Guangdong province planned to keep migrants for the Spring Festival, but the state promised that everyone could go back home before the Spring Festival Eve. This situation remained until the National Headquarters for Coal, Power and Oil Transportation and Disaster Relief and Rescue was set up on January 28. Since only a few of the millions of plans had been exercised, it was hard for different agencies to work together when this large scale disaster happened. In some situations, command and coordination functions had to rely on temporary organization.
3. Lack of monitoring and early warning. The public could not take actions to cooperate with the government and protect themselves from harm. According to NERP and NERL, disasters are divided into four levels according to the amount of damage in order to declare warnings and mobilize response, with criteria set by the state and its departments. But the capacities are different for various local governments. If the Southern Snowstorm happened in North China, it would be a normal incident, but it occurred in South China, where such a heavy snowstorm has seldom occurred and where the agencies have no experience in managing such an event.
4. Lack of professional search and rescue teams. The heavy snowstorm required a professional team to remove the frozen ice that covered the power lines, but in fact this work was done by migrant workers with their hands.

The Southern Snowstorm was still under discussion in academic arenas when the Wenchuan Earthquake occurred, and reflections from the Snowstorm response were combined with those of Wenchuan Earthquake to identify the policy issues.

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### **Wenchuan Earthquake: Problems and Policy Adjustment**

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#### *Case 3: Wenchuan Earthquake*

At 2:28 pm on May 12, 2008, an 8.0 magnitude earthquake hit Wenchuan, southwestern China. It seriously devastated Sichuan, Shanxi, and Gansu provinces. As one of the biggest disasters since the founding of the People's Republic of China in 1949, the Wenchuan Earthquake caused 69,227 deaths, 17,923 missing, 374,600 injured, with direct economic losses of ¥845.1 billion (Shi et al. 2010). Most victims were killed by collapsed buildings and secondary disasters, such as landslides, mudslides, and unstable lake barriers that collapsed suddenly.

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Under the new disaster management policies, the emergency management of China's central government won praise for its immediate response after the shock, and its rapid recovery and reconstruction program in terms of providing counterpart aid. In accordance with the National Earthquake Response Plan, earthquakes at level "I" refer to those earthquakes that cause more than 300 deaths, or direct economic losses above 1 per cent of GDP, or earthquakes that occur in densely populated areas with magnitudes above 7.0. The Ministry of Civil Affairs launched the emergency response plan immediately and responded to Wenchuan Earthquake at level "II", then upgraded to level "I" in the evening of the same day. Premier Wen Jiabao acted more promptly and arrived in Dujiangyan city just two hours after the earthquake, and then set up the command headquarters to mobilize operations for emergency rescue and relief. In addition, recovery and reconstruction operations were given high importance for the first time. Emergency management turned to the recovery and reconstruction stage just four months after the earthquake, and successfully completed the task within three years, with better infrastructure than before and sustainable industrial development.

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However, the new disaster management policies still have some problems that need to be solved:

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1. Lack of unified command and coordination. Like the response to the Southern Snowstorm, command and coordination in the early stage of response operations for the Wenchuan Earthquake had some difficulties, especially for cooperation between military units and the administrative system, rescue forces in different systems, and governments and NGOs, due to the lack of an existing unified command system like the National Incident Management System (NIMS) in the USA. In the early stage of response, all organizations, materials, and rescue forces were over-centralized in Dujiangyan city, and disorder in command and coordination remained until the joint command headquarters of Chengdu Military Region was authorized by the Central Military Commission. Meanwhile, besides the army and national rescue team, 94 rescue teams from various provinces worked in the field, 41 teams arrived from mining and

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330 hazardous chemical rescue forces, and 31 teams came from fire departments. It  
 was difficult to allocate these teams as needed, due to the lack of unified  
 command and coordination. As a result, some regions were over-targeted with  
 too many rescue and relief efforts, while other regions were insufficiently targeted  
 (UPDN 2008).

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- 335 2. Lack of professional rescue teams. Among all the rescue teams that dealt with  
 the Wenchuan Earthquake, the National Earthquake Rescue Team played the  
 most significant role. As the most professional rescue force of China's  
 government, it included seismologists, engineers, and doctors, all supplied with  
 professional equipment and experienced in earthquake search and rescue.  
 340 However, the national team only has 230 members in total, so it was described as  
 "the scarce orange hope" by journalists, due to the team's orange uniform  
 (China News Weekly 2008).

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- 345 3. Lack of preparation and early warning. In the Wenchuan Earthquake, school  
 buildings, hospitals, and villagers' houses were severely damaged. The main  
 reason for the huge devastation caused by the Wenchuan Earthquake was the  
 lack of compulsory construction standards for buildings and facilities in the  
 rural areas of China. Villagers built their own houses, sometimes unfortunately  
 locating their houses in areas with high risk of landslides or mudslides.  
 350 Meanwhile, the early warning system for earthquakes had not yet been  
 established.

- 355 4. Lack of disaster education. Rescue and relief operations in earthquakes mainly  
 depend on self and mutual help, especially in remote mountain villages, because  
 the rescue forces from outside can not reach these areas immediately after the  
 earthquake. Before the Wenchuan Earthquake, local residents were less  
 educated and trained in how to escape from a disaster. As a result, most  
 survivors did not have any experience in guiding the rescue forces.

360 Based on reflections from the Southern Snowstorm and the Wenchuan Earth-  
 quake, China's central government began to adjust its disaster management policies  
 based on the new framework constructed after SARS in 2003. The second generation  
 disaster management system was basically formed and later applied in other disasters  
 like the Yushu Earthquake on April 14, 2010, and the Zhouqu Mudslide on August  
 7, 2010. Generally speaking, the policy adjustments after Wenchuan Earthquake  
 365 include:

- 370 1. Establishment of a comprehensive rescue team that includes local authorities  
 and professional search and rescue team members from the army. As well as the  
 existing rescue teams from fire fighting, armed police, flood fighting, earthquake  
 rescue, forest fire, marine search and rescue, mine rescue, and medical care,  
 comprehensive teams for multiple types of disasters were assigned importance.  
 375 After the Wenchuan Earthquake, five provinces set up comprehensive teams,  
 and based on the PLA Non-war Capacity Building in Military Operation  
 Planning issued on January 5, 2009, eight army rescue teams were organized to  
 strengthen search and rescue capacity in unexpected catastrophes. In addition,  
 the role, procedures, and mechanisms for the army to participate in emergency  
 relief and rescue operations have been defined and clarified.

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2. Emphasis on the exercise of emergency plans. In 2009, the State Emergency Office issued the Guidelines for Exercise of Emergency Plans to push and direct emergency training exercises so the command and coordination would operate smoothly when disasters occur. Some departments like the Ministry of Transportation revised their emergency plans to solve the problems experienced in the Southern Snowstorm and the Wenchuan Earthquake. 380
3. Greater attention granted to emergency preparation and early warning. After the Wenchuan Earthquake, central government carried out a three-year project of reinforcement engineering for primary and middle school buildings nationwide. For long term consideration, China accelerated the process of revising the Earthquake Prevention and Disaster Mitigation Act, which was proposed before the Wenchuan Earthquake. The new act was issued in December 2008, six months after the earthquake, to establish an early warning system for earthquakes and specify stricter regulations and instructions for earthquake resistant standards on site selection, design, and construction. 385  
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4. Implementation of routine disaster education. After the Wenchuan Earthquake, May 12 was set as the National Day for Disaster Prevention and Reduction to provide routine disaster education to the general public through various preparedness activities. 395

As the emergency structure stipulates in the NERP, responsible officials are held accountable not only in the response operations period, but also in the whole emergency cycle, including periods of prevention and preparation, early warning and monitoring, and rehabilitation and reconstruction, which are not the responsibilities of the administrative sectors. It would be unfair if we only accounted for the responsibility of the administrative sectors which will ultimately damage the authority of the government. In this case, on July 12, 2009, the CPC Central Committee issued specific situations for the Provisional Regulations on Accountability of Party and Governmental Officials. This effort sought to make party and government officials the intended targets of accountability, which to some degree solved the problem of the imbalance between power and responsibility. Although the content of their responsibilities remains unchanged, the regulations mainly focus on managing the emergency, information release, and mass petitions. Four situations are directly related to public emergency: (1) major accidents, incidents, cases in local regions, departments, systems, or units because of dereliction of duty or successive occurrence of serious accidents, incidents, and cases which cause severe damage or impact in a short period; (2) major accidents, incidents, and cases resulting from ineffective management and supervision of the functional department of the government, or recurrence of serious accidents, incidents, and cases which cause severe damage or impact in a short period; (3) abuse of power during administrative actions, use of force, or inciting others to commit illegal administrative actions or malfeasance that causes mass disturbance or other major incidents; (4) improper attention to mass disturbance or public emergency that leads to deterioration of the situation and results in harmful impacts. It not only broadens the objectives and content of the accountability system, but definitely includes prevention and even solicitation of mass disturbance. 400  
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### Discussion and Conclusions

In general, after experiencing three catastrophes like SARS, the Southern Snowstorm, and the Wenchuan Earthquake, China's government has established a new disaster management system that has evolved into a comprehensive emergency management system, with effective change in specific areas. The new system:

1. Broadened the focus on multiple hazard types to make responsibilities clearer for central and local governments, departments and agencies, and officials in the CPC or administrative sectors. A given department and an assigned official must respond to, and be accountable for, a disaster when it happens.
2. Extended the emergency cycle forward and backward to make the emergency more institutional than before with procedures for emergency management, which are standardized to encompass a complete emergency cycle covering four stages from preparation and prevention to recovery and reconstruction.
3. Increased efficiency of emergency response operations. NERP, NERL, and the accountability system make emergency management faster and more professional than before. A total coverage of the emergency response plan reinforced the preparation for disaster to some degree, and establishment and training of rescue teams makes the response behavior more efficient.

However, due to the structural constraints of China's political system, some policy changes were not as effective as assumed.

1. The new system broadened the focus on multiple hazard types and established emergency exercises, but failed to develop an institutionalized unified command and coordination system. For this reason, some major disasters have their own command and coordination systems. For example, for earthquakes, the top organization was the State Earthquake Resistance and Rescue Headquarters; for floods, the top organization was the State Flood Control and Drought Relief Headquarters. This situation may result in chaos in emergency management when a catastrophe happens. In fact, two years after the Wenchuan Earthquake, the chaos in command and coordination emerged once again in emergency management of the Yushu Earthquake, but the situation improved after the joint headquarters was established by the military unit. But why did the central government not set up a unified command and coordination structure? The main reason was that it was difficult to integrate all the departments and agencies that have responsibilities in emergency management.
2. The NERP function was limited in terms of coverage from the top down. Local governments are responsible to higher authorities rather than engaging in self-governance, so emergency response plans are made in accordance with the higher level of government rather than based on local risks. As a result, the emergency response plans are similar at various levels, but actually local risks at various levels are very different. Especially in communities and towns, most emergency plans do not apply to real response.
3. Strong government and weak civil society prevented effective cooperation between government and NGOs and volunteers, especially in command and

coordination and disaster education. In the Wenchuan Earthquake, NGOs and volunteers played a huge role in disaster relief, but there were lots of problems, such as most volunteers depending on government to allocate their tasks, and most of the donations from NGOs having to enter the governmental finance system (Chen 2009; Shawn and Guosheng 2011). It is significant that the NERL never really considered how to incorporate NGOs and individual volunteers into disaster response operations. Besides, NGOs and volunteers could not make increased contribution to disaster education because of the continuing malfunctions in the management of NGOs and volunteers, while the government could not adapt disaster education to the needs of different groups in accordance with their various social vulnerabilities. Therefore, in the short term, need remains for the governments to take action to solve specific problems, but in the long run China's central government must push forward political reform in order to solve the structural problems.

## References

- Chen, J. and Zhu, J., 2009, From SARS to Wenchuan Earthquake: Chinese civil society response to disaster, in: *Proceedings of the 4th Cross-Strait Forum on Disaster and Public Management*, Center of Management of Social Risk and Public Crisis, Nanjing University.
- Cai, R., 2008, China national search and rescue team of earthquake: the scary orange hope. *China News Weekly*, 2, pp. 36–37.
- People Net, 2009, How do we cope with disaster? December 8. <http://gov.people.com.cn/GB/46737/3895401.html>
- Shawn, S. and Guosheng, D., 2011, An emerging civil society: The impact of the Sichuan Earthquake on grassroots associations in China. *The China Journal*, 65, pp. 181–194.
- Shi, P., Wang, M., Wang, J., Xu, W., Tang, D., Chen, W. and Shuai, J., 2010, Criteria for a catastrophe and catastrophe insurance based on the cases of Wenchuan Earthquake and South Snowstorm, in: *Proceedings of National Forum on Disaster Prevention, Reduction and Sustainable Development*, Beijing.
- Song, T., 2008, An empirical study on development of Chinese accountability system. *Journal of Chinese Public Administration*, 1, pp. 12–16.
- State Emergency Office, 2007, Report on emergency management in China in 2006. *Journal of Chinese Emergency Management*, 7, pp. 1–4.
- Tang, T., 2007, Chinese practice of accountability system. *Journal of Chinese Public Administration*, 1, pp. 6–8.
- Xinhua Net, 2008, Frozen caused damage to power lines of several south provinces and Guizhou declared a large-scale power failure. [http://news.xinhuanet.com/politics/2008-01/30/content\\_7522656.htm](http://news.xinhuanet.com/politics/2008-01/30/content_7522656.htm)
- Zhang, H. and Tong, X., 2009a, Theory framework of capacity assessment for emergency management. *Journal of Chinese Public Administration*, 4, pp. 33–37.
- Zhang, H. and Tong, X., 2009b, Accountability system and governance on public crisis. *Journal of Chinese Political Studies*, 2, pp. 50–55.