

# Capacity empowerment and building: integrated recovery management framework in China

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## Abstract

Post-disaster recovery and reconstruction is one of the most complex yet challenging tasks confronting human societies. The responsive and decisive recovery efforts made in the aftermath of “5.12 Wenchuan Earthquake” have gained China worldwide recognition. On a basis of field-based surveys, this paper reviews the approaches that authorities in China have utilized for post-Wenchuan earthquake recovery and reconstruction. This paper brings into prominence the three essential elements, being strategic; institutional; and executive; which made effective recovery capability empowerment and implementation possible. Further an overall post-quake recovery management framework is developed to furnish a broad picture of the dynamic and multi-agency recovery practice and the success of recovery work in the wake of “5.12 Wenchuan Earthquake”.

*Keywords: Wenchuan earthquake, recovery, framework, lessons learned.*

## 1 Introduction

On 12 May 2008 an earthquake measuring 8.0 on the Richter scale struck the Western China's province of Sichuan and its neighbours, killing 69,266 people, injuring 374,643 people and leaving 17,923 people missing (as of September 11, 2008 noon). The earthquake caused widespread destruction to buildings and



infrastructure. Approximately 34,125 kilometers of highways, 1,263 reservoirs, 7,444 schools, 11,028 medical institutions and numerous urban, rural residences and factories were devastated by the earthquake with direct economic losses reaching RMB\$843.77 billion (USD \$123.69 billion) State Planning Group of Post-Wenchuan Earthquake Restoration and Reconstruction [1]. The subsequent persistent heavy rains and numerous aftershocks further compounded the situation, leading to a large number of secondary hazards such as landslides, landslips, mud-rock flow and 'quake lakes'.

The Central Government of China took swift responsive action to establish a multi-governmental management framework for the recovery operation. In conjunction with local governments in earthquake affected areas, the State Council has made sponsoring its watchword through a variety of programs. In spite of different forms of these initiatives, the key element in common was to stimulate and promote the use of resources both nationwide and locally.

It is widely acknowledged that China coped with this large-scale natural disaster well and effectively dealt with relief and recovery in the aftermath of Wenchuan earthquake. This paper aims to understand, in a general sense, the macro-issues that face China during post-quake recovery and reconstruction. Using empirical data gathered from interviews, this paper identifies three main elements required for a desirable recovery performance: strategic, institutional and executive elements. The summarized framework and lessons learned are hoped to provide a broad view of China's efforts and outcomes in post-Wenchuan earthquake recovery.

The remainder of this paper will present research design and then address three questions based on the survey data:

- (1) What strategic policies were adopted for post-disaster recovery efforts?
- (2) Who were responsible for post-disaster recovery?
- (3) What measures were taken to facilitate post-quake recovery implementation?

Ultimately this research seeks to propose a comprehensive recovery management framework for practitioners to direct and improve recovery performance after a natural disaster.

## 2 Research methods

Qualitative research methods were adopted in this paper including desk reviews of policy documents and media publications and field-based elite interview survey with a view to gathering empirical data on perspectives and insights of those participating in post-Wenchuan earthquake reconstruction. The interview instrument was semi-structured, open channel for further probing of the issue during interviews [2, 3]. Focus was given on salient features of post-Wenchuan earthquake recovery practice and the roles of different stakeholders. This is one basis for a proposed comprehensive recovery management framework and lessons learned for other disaster-prone and affected countries.

The selected interviewees were composed of 6 government officials involved in post-Wenchuan earthquake recovery and reconstruction in Sichuan Province

and 5 academic researchers in disaster reduction and management in China. The interview sessions were voice recorded, at the interviewee's discretion, transcribed and coded. The qualitative survey findings were used to develop ideas for arriving at a comprehensive recovery management model.

### 3 Recovery strategic policies

At its 14th meeting, The Earthquake Relief Headquarters under the State Council made a decision to shift earthquake relief work from earthquake response to recovery with more efforts to be focused on resettlement and reconstruction. This resolution symbolized that China entered a 'new stage' of post-earthquake recovery. The overall recovery milestones after Wenchuan earthquake is illustrated in fig. 1.

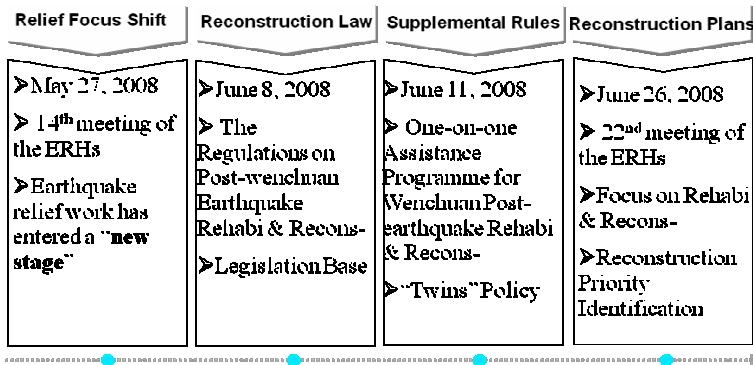


Figure 1: Post-Wenchuan earthquake recovery policy milestones.

#### 3.1 Solid legislative ground

The existing laws in China applicable in the disaster context are the Emergency Response Law of the People's Republic of China (came into effect on November 1, 2007) and the Law of the People's Republic of China on Protecting against and Mitigating Earthquake Disasters (came into effect on March 1, 1998). After the earthquake, The State Council of China took swift legislative action to establish a multi-governmental management framework for the recovery endeavour. The Regulations on Post-Wenchuan Earthquake Restoration and Reconstruction (came into effect on June 4, 2008) was formulated on a basis of the above two laws specifically setting guidelines and priorities for Wenchuan earthquake recovery and providing an important legal ground for various departments and government agencies, both inside and outside the quake-hit region, to assist with recovery and reconstruction work (see fig. 2).

The 'Regulations' highlighted the significance of restoration and reconstruction of schools and hospitals and other public service facilities and

stipulated compulsory construction standard norms for rebuilding those infrastructures. In the meantime, the people’s well-being was deemed the fundamental issue in post-Wenchuan earthquake restoration and reconstruction, the top priority was, therefore, given to repairing and rebuilding residential houses, restoring public facilities and infrastructures, to ensure the resettlement, stability and reassurance of the affected population.

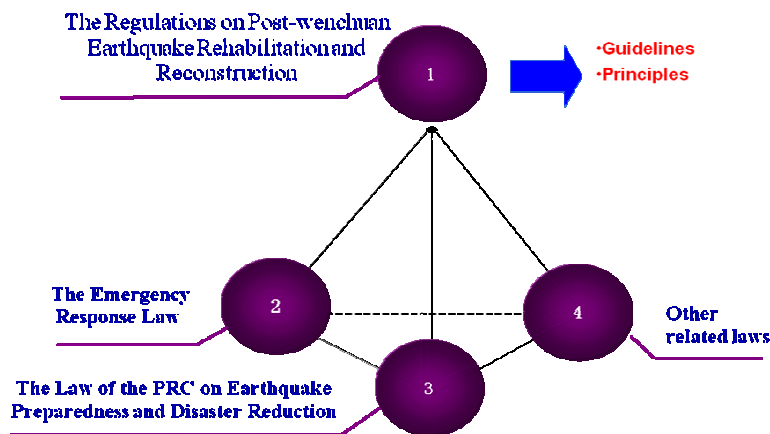


Figure 2: Legal ground for post-Wenchuan earthquake recovery and reconstruction.

### 3.2 Supplementary policy

As a supplementary policy to aid the full implementation of the ‘Regulations’, One-on-one Assistance Program for Wenchuan Post-earthquake Restoration and Reconstruction became a key constituent of China’s post-disaster management framework. The earthquake-stricken areas of Sichuan, Gansu and Shaan-xi provinces were divided into 24 districts and twinned with 24 relatively developed localities across China. For instance, the historical tourist city Dujiangyan is sponsored by Shanghai municipality and the well-known industrial city Mianzhu is assisted by Jiangsu province in China’s developed east coast. Sister localities have been tasked over the next three years with funding 1% of their GDP, provision of human resources and temporary housing units, and in-kind support from planning institutions and other departments in association with disaster reconstruction.

The ‘One-on-one Program’ featured prominently in the reconstruction, through assistance with rebuilding infrastructure such as roads, water and sewage, electricity, and broadcasting, public buildings such as schools, hospitals, clinics, and key sectors of the economy, such as tourism and production facilities. Sponsoring localities and their local reconstruction counterparts have been communicating and cooperating to achieve common objectives of reconstruction. As winter drew near after the earthquake, reconstruction work was accelerated in some quake-hit areas where local officials had promised that



no people in the quake-hit area would live in the makeshift accommodation during the wintertime. The time pressure had been best met before Chinese traditional New Year through partnership between government institutions and communities.

There were also a range of financing/fiscal policies including taxation, credit and employment policies to support reconstruction, for the purpose of this study, the paper only discuss the highlights of the interviews.

### **3.3 Comprehensive recovery and reconstruction planning**

Four months after the earthquake a comprehensive reconstruction plan The State Overall Planning for Post-Wenchuan Earthquake Restoration and Reconstruction developed in partnership with all parties involved was released for implementation. As the recovery steps entered into an overall rebuilding stage, the role and responsibilities of the Chinese government have shifted to technical support and supervision of reconstruction implementation with less administrative intervention.

The State Overall Planning for Post-Wenchuan Earthquake Restoration and Reconstruction was aimed at a more integrated and balanced reconstruction and redevelopment of earthquake affected areas. Reconfirming people-focused security as top priority, the document commits to a stringent 'Quality Control System' consistently incorporated into reconstruction process. In addition, the reconstruction planning was oriented toward accelerating and streamlining the reconstruction process by sensible layout and design without detriment to the sustainability of areas quake-affected, contextualizing the reconstruction effort to its local environment.

In all, due to the centralized government system, China was capable of mobilizing and deploying the necessary materials, resources and funds by assembling the forces of governments, organizations, and communities. It is important to note that the timely policies and regulations for the recovery purpose were introduced in place to guide people for earthquake relief and those participating in the long term reconstruction and rehabilitation process.

## **4 Recovery supporting institutions**

During the reconnaissance trip to earthquake-affected areas in China in December 2008, we observed that the earthquake recovery was impressively rapid and decisive with enormous effort focused on rebuilding residences. This result, in light of interviewees in our research, was largely attributable to the introduction of a streamlined recovery institutional structure (fig.3) which fully empowered local decision makers to organize and manage reconstruction work and pursue high level of resilience and administration capability. According to fig.3, it can be concluded that China has built a reconstruction mechanism featuring the joint participation of governments, enterprises, social organizations and individuals, with a prominent role of counterpart assistance.

According to government official interviewees, on the top of leading regime for post-Wenchuan earthquake recovery is China's National People's Congress



(NPC), China's top legislature and the highest office of State power. The State Council, namely the Central People's Government, the highest executive office of State power, as well as the highest office of State administration, is in charge of policy making and advising for quake recovery and reconstruction. The departments concerned under the State Council are responsible for guiding and coordinating tasks that aid restoration and reconstruction in disaster areas.

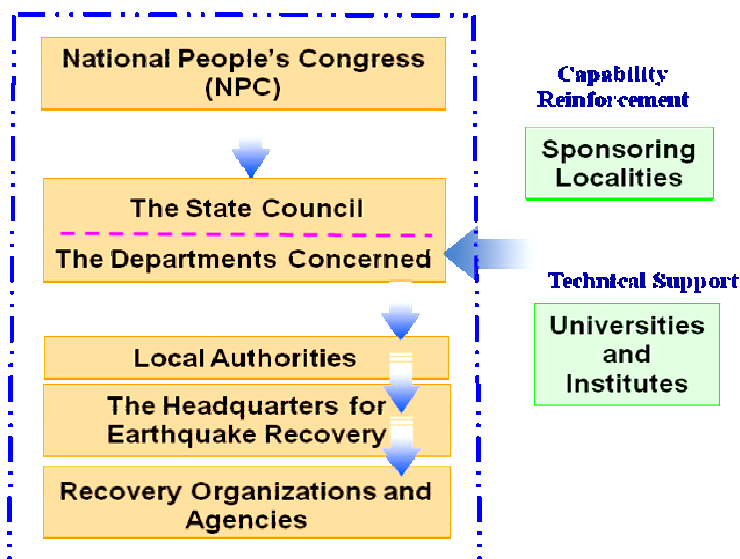


Figure 3: Post-Wenchuan earthquake recovery institutional structure.

The Sichuan provincial government played a significant role in restoration and reconstruction work with unified leadership, overall coordination, supervising and checking the planning implementation while the people's governments at city and county level concretely undertook the major tasks of shouldering and fulfilling the restoration and construction with organisations of all kinds.

## 5 Effective recovery initiatives

Under the robust policy and institutional recovery circumstances, a range of follow-up actions were initiated to facilitate implementation of recovery policies and regulations. Many recovery programs at local level aimed specifically at livelihoods issues had been effective in addressing employment needs and community capacity with a view to restoring the normal living conditions of the stricken community in an early time. The community-focused initiatives were also highlighted by the interviewees, which can be mainly summarized as:

- (1) to integrate disaster risk reduction into the recovery process
- (2) to assist people affected with subsidies for rebuilding their homes
- (3) to encourage community-participatory approach in reconstruction

### 5.1 Disaster risk reduction approach

One of the most pressing challenges during post-Wenchuan earthquake reconstruction was to ensure higher seismic standards and construction quality in rebuilding in order to minimize vulnerabilities of buildings to future disasters. In rural areas, a capacity building program combined with a targeted monetary incentive campaign was initiated locally to integrate disaster risk reduction into the reconstruction process. In addition, the local government organized experienced engineers and technicians to advise and provide training on safe rebuilding for people affected. Picture books, simplified construction guidelines, checklists, and on-site demonstration and inspection were provided to house-owners to convey the knowledge of disaster risk mitigation and to change the prevailing construction practices.

### 5.2 Post-quake reconstruction subsidies

The reconstruction subsidies vary in terms of the financial circumstance of the household affected and the number of family members. The amounts of subsidies in different situations are tabulated in table 1, table 2, table 3 and table 4 respectively. In order to encourage households to start retrofitting their residences early in urban areas affected by the earthquake, the local government set the different subsidizing criteria according to three different timelines (see table 4).

Table 1: Subsidies for destroyed rural residences (Unit: RMB yuan/household).

category of household	household 1-3 people	household 4-5 people	household more than 6 people
ordinary	16,000	19,000	22,000
poor	20,000	23,000	26,000

Source: <http://www.mz.gov.cn/gsgg>

Table 2: Subsidies for repairing or retrofitting rural residences (Unit: RMB yuan/household).

category of household	light damaged	medium damage	severe damage
subsidies	1,000-2,000	2,000-4,000	4,000-5,000

Source: <http://www.mz.gov.cn/gsgg>

A sum was allocated to each household in accordance with the construction progress. For example, RMB\$16,000 (USD \$2,336) subsidies were only granted to the rural household on the premise of better understanding and compliance with construction standards. Likewise, in urban areas, a 'filing system' was launched by local government. Only when drawings and schemes for rebuilding or retrofit were provided, were subsidies varying from RMB\$1,000 (USD \$146) to RMB\$8,000 (USD \$1168) given to the household in need.



Table 3: Subsidies for destroyed urban residences (Unit: RMB yuan/household).

category of household	household 1-2 people	household 3 people	household more than 4 people
the minimum income (Household with the minimum income refers to those who basically do not have any income)	29,000	32,000	35,000
low-level income (Household with low-level income refers to those whose average income is less than twice of the minimum living cost in Mianzhu city)	26,000	29,000	32,000
ordinary-level income (Household with ordinary-level income refers to those whose income is between the levels of low and high income)	23,000	26,000	29,000
high-level income (Household with high-level income refers to those whose average income is more than three times of the average income in Mianzhu city)	6,000	8,000	10,000

Source: <http://www.mz.gov.cn/gsgg>





Table 4: Subsidies for repairing or retrofitting urban residences (Unit: RMB yuan/household).

category of household	light damaged	medium damage	severe damage
start before 12th May 2009	3,000	5,000	8,000
start between 13th May and 30th Sep. 2009	2,000	4,500	7,000
start after 1st Oct. 2009	1,000	4,000	6,000

Source: <http://www.mz.gov.cn/gsgg>

### 5.3 Community participatory programs

The overall post-earthquake objective in China, according to the interviewees, is to not only 'Build it back better', but 'Enhance community resilience'. Hence, from the beginning of reconstruction, China set steps towards long-term economic and industrial restoration and community self-reliant reconstruction. Such an objective means more community participation in post-disaster reconstruction and the creation of long-term sustainability building up resilience in earthquake impacted areas.

The local government launched a series of work relief programs in order to encourage people affected to get engaged in post-quake reconstruction; for instance, establishing 'work relief funds' from the restoration and reconstruction funds for ruins clearing, construction of transitional aftercare sites as well as the renovation of medium-sized rural infrastructures. This provided those who lost their land or became unemployed with an opportunity of involvement in reconstruction work. Moreover, government encouraged people affected to participate in reconstruction planning and implementation of these plans. The restoration and reconstruction of rural dwellings was mainly conducted by farmers with a combination of governmental subsidiaries and technical guidance, partnership assistance and social help and support.

## 6 Post-earthquake recovery management framework

The in-depth analysis of interviews provides a multi-perspective view of recovery and reconstruction in the wake of a natural disaster. The findings of identified key stakeholders and main elements strategic, institutional and executive in post-disaster recovery process reveal that post-disaster reconstruction is an arduous, complex and multi-discipline task, requiring a systematic approach which need to be supported through integrated planning and implementation with all identified elements incorporated. It is proposed a comprehensive recovery management framework (fig. 4) adopted in China to help practitioners understand, visualize, coordinate and manage various post-disaster recovery issues efficiently.



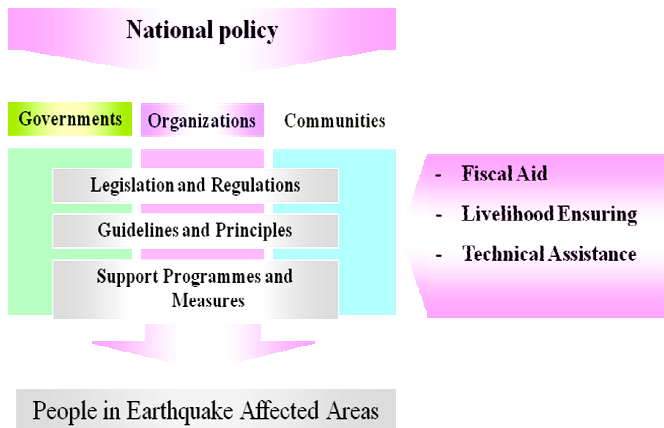


Figure 4: Post-Wenchuan earthquake recovery management framework.

Most of elements in the recovery management framework imply higher direct government engagement and influence, and should thus have significant effect on reconstruction performance in the long term. This framework highlights the significant role of government in rationalizing the determination of reconstruction modes, preferential sectors and construction sequences in a planned and phase-oriented approach. However, policy guidelines around reconstruction is still evolving, and further initiatives in recovery are required.

## 7 Conclusion and lessons learned from post-Wenchuan earthquake recovery

It is widely acknowledged that China coped with this large-scale natural disaster well and effectively and efficiently dealt with relief and recovery in the aftermath of Wenchuan Earthquake. Nevertheless, many of the challenges that faced Chinese government and reconstruction practitioners are still visible. The coordination problems among different players and imbalance between Government's macro-control and market self-regulation remain a serious concern. By virtue of field-based survey in China after '5.12 Wenchuan Earthquake', we identified the three salient elements in recovery process, namely the strategic element, the institutional element and the executive element. Based on the survey results, we proposed a comprehensive framework (fig. 4) which synthesizes identified elements, providing an overview on post-earthquake recovery practice.

There are lessons to be learned from the disaster for both China and the international society. There is a need for speed and efficiency in relief work, a need to build a strong organizational structure to deal with the reconstruction and a need to keep social communities fully involved in planning and implementing reconstruction throughout all post-disaster stages.

A central policy planning with a decentralised mechanism to ensure decision making and involvement of all players and implementation of the recovery plan

made recovery relatively smooth. The special powers from all parts of government, across different sectors, at national, provincial and county levels were consistent.

The Regulations on Post-Wenchuan Earthquake Restoration and Reconstruction set the legal requirements for reconstruction. The appropriate legal system in line with a series of policy changes for recovery made effective coordination and delivery of reconstruction work possible.

The sustainable reconstruction process was well planned and implemented with a wide variety of community participatory approaches which incorporated hazard mitigation and risk reduction measures into a holistic reconstruction framework.

The Wenchuan Earthquake recovery and reconstruction serves as an exemplar of success in what was a disastrous and complex environment. Further study of this recovery and reconstruction, should be capitalised upon in order that the potential for improving recovery, reconstruction and community resilience can be realized in other disaster prone and impacted countries.

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