

THE PAIR-WISE PROVINCE-TO-COUNTY AID MODEL FOR DISASTER RELIEF

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China first adopted a pair-wise aid policy, in which one donor province or city is assigned to a recipient area, in the 1950s as part of its efforts to develop the minority-inhabited border areas, and this practice was first formalized by the central government in 1979 (Qian et al. 2012). Since then, this strategy has also been used to undertake major infrastructure construction projects (such as the Three Gorges Dam in 1992) and disaster relief and recovery (such as that following the 1976 Tangshan earthquake), and China has continued to hone this method of coordinating the entire country to achieve key objectives. The integration of the pair-wise province-to-county aid model, in which a specific province is assigned to help a disaster-stricken county, into China's disaster relief and reconstruction plans following the 2008 Wenchuan earthquake was a significant institutional innovation. According to the model, when several counties or cities are simultaneously hit by a major catastrophe, other relatively wealthy provincial governments of regions not stricken by the disaster use their resources to directly aid a certain county or city on a one-to-one basis. This chapter describes the disaster itself, the government's response, and the policy innovation process behind the formulation of the pair-wise aid relief and reconstruction plan, and it provides additional insights on this policy and its implications.

The Wenchuan Earthquake and Its Challenges for Disaster Relief

At 2:28 p.m. on May 12, 2008, an earthquake of magnitude 8.0 struck Wenchuan County, Sichuan Province. Ten provinces (or provincial-level cities)—including Sichuan, Gansu, Shaanxi, Chongqing, Yunnan, Hubei, Guizhou, Henan, Shanxi, and Hunan—were hit, with northern Sichuan, southeastern Gansu, and southwestern Shaanxi the most severely damaged. In the worst-hit areas, roads, telecommunications, and other infrastructure; factories and other production facilities; and public utilities such as electricity

providers, as well as shops, schools, and hospitals were devastated. The Wenchuan earthquake caused the greatest destruction, affected the widest area, and presented the biggest challenge to rescue operations in China since 1949; it was also a major event in the history of global disasters.

The Wenchuan earthquake was also followed by numerous high-intensity aftershocks. The earthquake measured 8.0 on the Richter scale, with the highest intensity of the epicenter reaching 11 degrees on the Modified Mercalli Intensity scale. As of October 21, 2008, more than 33,000 aftershocks had been detected, with 7 measuring above 6.0 on the Richter scale, more than 60 ranging from 5.0 to 5.9, and more than 600 ranging from 4.0 to 4.9 (China, Ministry of Civil Affairs, NCDR and UNDP 2009). The initial estimate by the Chinese Seismological Bureau for the Wenchuan earthquake was 7.8 on the Richter scale (CCTV 2008). A week later, however, the Bureau revised the number to 8.0. In fact, 10 quakes measuring above 7.0 on the Richter scale hit the area in succession within one minute. Variations in the direction and force of these quakes resulted in massive destruction. As a result, several villages were entirely buried by landslides (Batson 2008). Such unbelievably high seismic intensity is rare in the history of China's disasters.

The Wenchuan earthquake affected a wide range of areas, including 10 provinces (or provincial-level cities) including Sichuan, Gansu, Shaanxi, and Chongqing; 417 counties; 4,667 townships; and 48,810 villages. The total disaster-stricken zone covered 500,000 square kilometers, including 116,700 square kilometers of heavily hit areas. A population of 46.25 million people was affected (China, Ministry of Civil Affairs, NCDR and UNDP 2009). This nationwide catastrophe called for disaster relief efforts with strong management and coordination capacity.

The effective dispatch of disaster relief forces depends on a correct analysis of the regional structure of the disaster—that is, the pattern followed by an earthquake's destructive force—throughout the earthquake-stricken areas. In the past, the destructive force of earthquakes has spread out from the epicenters equidistantly, forming a circular, radial disaster pattern. In the Wenchuan earthquake, however, the worst-hit areas were characterized by a regional structure in which the epicenter was located at the periphery of the disaster-stricken zone.

At first, the traditional perceptions of an equidistant circular disaster structure guided relief efforts, and as a result, disaster relief was focused on cities near the epicenter, such as Yingxiu and Dujiangyan. However, Beichuan, a county hundreds of kilometers away from Wenchuan, was actually the

second-hardest hit (in terms of deaths); nearly the entire county was razed to the ground.

The actual regional structure of the disaster was rare and unusual, following a single-line array pattern. The pattern developed along the Longmen Mountain Fault Zone, and its rays extended to the northwest, with its epicenter at Yingxiu, Wenchuan County. This single-line array formation was almost 300 kilometers in length from the southwest to the northeast and 80–100 kilometers in width from the southeast to the northwest. This unique structure was beyond the experts' traditional understanding of regional disaster patterns. However, later it was learned that Wenchuan County might not be the worst-hit area compared with Yingxiu, Beichuan, and Qingchuan, as many houses in Wenchuan County had recently been renovated (and therefore made more resilient). Wenchuan, Beichuan, and Qingchuan Counties were the most affected. Hanyuan County of Ya'an, Sichuan Province, was also one of the heavily hit areas, even though judging from a map, it appears to be an enclave far away from the epicenter.

The unusual regional structure of the disaster area exerted a huge impact on the command of the disaster relief operations, particularly on the allocation of personnel and the distribution of equipment and materials.

Furthermore, the disaster region featured rugged terrain and a large area, posing a challenge to the disaster relief operations. China, with its centralized administration system, has an advantage in terms of mobilization. However, the entire disaster area covered a mountainous region with an average altitude of more than 1,000 meters and peaks higher than 5,000 meters. The worst-hit areas of the mountainous region suffered from severe traffic and communications disruptions, as well as riverway blockage that impeded the deployment of rescue workers, rescue materials, and large-scale rescue equipment.¹ The road from Yingxiu to Wenchuan was completely blocked by rockfall from nearby mountains, and the recently completed Chengdu–Jiuzhaigou Freeway, in which the Sichuan government had invested more than RMB 1 billion, was totally destroyed.

In addition, the disruption of major transit arteries, rural roads, and communications networks, as well as administrative command networks, hampered the disaster relief command system. Generally, China's organizational

1 This area's terrain is so rugged that it has been said "One man guarding the pass will stop 10,000 from getting through." As if to prove this saying, the government of the Qing Dynasty waged wars for 10 years in this region and failed to enter Yingxiu because of the complexity of the terrain.

system and vast number of grassroots cadres are considered to be important advantages of the Chinese form of government. However, following the Wenchuan earthquake, the grassroots organization network collapsed.

It was impossible to coordinate an orderly evacuation without essential communications capabilities. Therefore, people trapped in the mountains decided to evacuate the young people and children first. Others did their utmost to follow suit once the situation had improved. Most of the infrastructure in the disaster area, including 15 national roads and principal provincial roads close to the epicenter and five railway lines, was severely damaged.

Normal life in the disaster-hit area was disrupted because of extensive outages of electricity, communications, water supply, and other public utilities; production halts among all enterprises; and serious damage to government agencies, schools, and hospitals, as well as ravaged farmland and agricultural facilities. One assessment of economic loss was RMB 800 billion. In fact, the total might be far beyond this number; the actual financial loss may have exceeded RMB 1 trillion.

The Wenchuan earthquake also featured numerous aftershocks and secondary disasters. As of September 1, 2008, more than 27,000 aftershocks had been detected, with several measuring above 6.0 on the Richter scale. Massive landslides and intense post-disaster rainfall resulted in frequent landslides and debris flows, leading to incredibly dangerous barrier lakes. These secondary disasters proved tremendously problematic for the disaster relief operations.

For instance, on May 19, 2008, the earthquake relief headquarters in Sichuan announced that earthquakes measuring above 7.0 on the Richter scale might occur later that day. The warning was broadcast repeatedly on radio and TV, and almost all citizens, more than 300 million people in Xi'an, Chongqing, and Lanzhou, left their homes to avoid the allegedly imminent quake, an evacuation that set a record in the global history of disaster relief. However, it turned out to be a false alarm. In fact, these types of false alarms and errors have brought into question the usefulness of emergency warning systems, which are already plagued by administrative uncertainty in China because no agency has yet been designated as responsible for releasing earthquake warnings (Chen 2014).

That is not to say that Sichuan was not hit by aftershocks. In fact, it was stricken by aftershocks measuring above 5.0 on the Richter scale dozens of times. One such aftershock of magnitude 6.4 hit Qingchuan County, resulting in extensive damage. Moreover, the Tangjiashan Barrier Lake, holding hundreds of millions of cubic meters of water, presented the greatest threat to disaster relief operations.

In addition, the Wenchuan earthquake resulted in a huge number of casualties and triggered the relocation of tens of millions of victims. As of 12 a.m. on September 18, 2008, the death toll stood at 69,227, with 374,643 injured and 17,923 missing (Post-Disaster Reconstruction in Sichuan Province Committee 2010a, 2010b). Sichuan had become the worst-hit province with 68,708 dead and 360,796 injured. In addition, the majority of the buildings in the disaster area collapsed. The counties and townships of Beichuan and Yingxiu in Wenchuan were razed to the ground. Four hundred sixty-six cadres from Beichuan County died in the earthquake, accounting for nearly one-quarter of all civil service personnel and 23 percent of all cadres prior to the earthquake. The loss of the cadres complicated the organizational efforts of relocating victims and handling remains. Another major relief task involved the resettlement of hundreds of thousands of victims transferred from the disaster area to the Chengdu Plain, such as the tens of thousands of victims who were moved to Jiuzhou Gymnasium in Mianyang.

Furthermore, the disruption of major railway lines, especially the Baoji–Chengdu Railway, made coordination of nationwide disaster relief operations difficult. Originally, railways provided the most effective and quickest connection between Sichuan and Beijing, and between North China and Central China. Nonetheless, when the earthquake occurred at 2:28 p.m., a locomotive with 12 cars loaded with gasoline had just entered the No. 109 tunnel on Baoji–Chengdu Railway. The resulting collapse damaged the train and killed the driver and much of the gasoline on board ignited or exploded, damaging portions of the tunnel.

The disruption of the Baoji–Chengdu Railway lasted for 283 hours, almost 12 days. During that time, the large-scale transportation of disaster relief materials was impeded. Fortunately, the Xi'an–Hanzhong–Sichuan Highway, which had just been completed, alleviated some of these logistical difficulties.

Meanwhile, experts from the Department of Transportation reported that more than 20 million cubic meters of rocks had piled up and had completely blocked the road from Yingxiu to Wenchuan, the only available road connecting Chengdu with disaster areas in Ngawa Tibetan and Qiang Autonomous Prefecture. Experts said it would take at least three months to remove the rocks because of the inability to deploy disaster relief forces. Ultimately, it did take three months and 20 days to complete this arduous task.

As a result, disaster relief teams had to make a detour of 800 kilometers and climb over two mountains, including Jiabin Mountain, to transport disaster relief materials from Yingxiu or Chengdu to Wenchuan. If the roads had not been blocked, they would have had to go only 80 kilometers from Yingxiu

or Chengdu to Wenchuan city. As a result, conducting effective rescue operations in counties of Wenchuan, Li, Mao, and Xiaojin in Ngawa Tibetan and Qiang Autonomous Prefecture was difficult. Only a limited number of helicopters were available for the deployment of disaster relief teams and materials.

Finally, the complicated and protracted nature of the emergency rescue missions of the Wenchuan earthquake made them akin to small-scale modern warfare maneuvers. When the earthquake occurred, the general headquarters of the State Council ordered that the disaster relief teams enter Wenchuan by 12 p.m. on May 13. However, subsequent rockslides from mountains not only blocked critical roads but also threatened the teams.

The early disaster relief operations following the Wenchuan earthquake revealed that significant institutional innovation would be necessary. Fortunately, by 2008 China's natural disaster relief and management system had gone through a dramatic transformation, including shifting from a focus on the reduction of financial losses to a focus on the well-being of people; from post-disaster relief to all-around rescue, and emergency rescue in particular; from reacting to events to systematic preplanning and emergency preparedness; from closed relief to all-around transparent relief operations. This last element involved upgrading relief standards to satisfy basic living requirements and meeting international standards and moving from the use of conventional working methods to the adoption of high-tech equipment.

Indeed, these changes laid a solid institutional foundation for the response to the Wenchuan earthquake in 2008 and therefore paved the way for further systematic and comprehensive improvement of the disaster relief system, even though the changes also created some significant challenges for disaster relief personnel, particularly the national administrative system.

Several initial challenges quickly became apparent. China had no special law for disaster relief; it issued regulations on disaster relief only in 2009. Moreover, no laws on disaster reduction or charity had been enacted, resulting in a huge institutional defect related to disaster relief operations. In addition, no plan was in place for coping with massive catastrophe. According to the current national disaster relief plan, in the case of a disaster resulting in a death toll of more than 200 people, the central government would launch a level 1 response, led by a vice premier. Nevertheless, no other higher response standards were in place in case a disaster resulted in a death toll of 1,000 people or more.

Other countries, by contrast, have established a systematic disaster prevention mechanism. For example, following the September 11 attacks, the United States mandated that either the president or the vice president must remain

in Washington, DC, at any given time and that they are not allowed to attend the same meeting at the same time. China has no such catastrophe plans. Furthermore, the absence of a well-functioning emergency relief organization system was problematic. During the Wenchuan earthquake, the national professional emergency relief team had more than 100 people in total. By contrast, Russia has an emergency relief team of more than 500,000 people. The United States has established 10 regional offices for disaster relief, and France, which is half the size of Xinjiang Autonomous Region, has also divided the entire country into 10 areas and provided 10 transport planes for disaster relief operations. Countries in Central Asia have emergency teams of tens of thousands of people.

Another problem was the lack of a transprovincial scheduling mechanism. In case of an emergency, the central government has to establish direct contact with the relevant local government offices. During the 2008 sleet and snow disaster in southern China, the lack of a special integrated scheduling mechanism hampered disaster relief operations.

Equipment shortages also hampered relief efforts. Disaster relief equipment, such as helicopters and even communications equipment, was in short supply. Inadequate supplies and budgetary allocations for administrative personnel's telephone expenditures in relation to emergency disaster relief communications have exacerbated the obstacles for disaster relief operations. In addition, reserves of relief materials have been insufficient. When the Wenchuan earthquake occurred, only 400,000 tents were available throughout the country, and no latrines, small generators, lighting equipment, or food was stored in the central material storehouses, reflecting how inadequate the supply reserve standards were.

Furthermore, only a few local plans were operational. Many local governments allocated responsibility for disaster relief tasks, but without providing specific operational procedures. The lack of a technical disaster relief assessment mechanism also proved problematic. The continuous improvement of public administration will be impossible without proper and scientific assessments of technologies and procedures. For example, after Hurricane Katrina, the US Congress proposed 17 lessons and 125 suggestions for the improvement of government administration, mainly related to specific technology assessments, in only one year.

In addition, few targeted plans and cases existed for frontline operations. First responders have had too few cases for study and preparation. Training for disaster relief should always focus on practical operations rather than theoretical research.

Finally, the absence of comprehensive emergency operation mechanisms also caused challenges. Emergency management offices at all levels in China have become ordinary offices instead of professional institutes. In contrast, in developed countries such as the United States, the staff of emergency management offices will not work there for more than two years because they must stay on duty all day long and get familiar with various technologies. In case of an emergency, the staff must be ready to establish necessary contacts and formulate plans instead of waiting for orders from the leadership.

During the Wenchuan earthquake disaster relief operations, China faced not only an unprecedented catastrophe but also an incomplete administrative system. At that time, the entire world was closely watching China's relief efforts, and China needed to mobilize all factors to carry out the relief operations promptly and effectively despite all obstacles and to ensure that relief activities met elite international standards in disaster management. Such an aggressive learning and adjustment process posed a historic challenge for China's disaster policies and agencies.

Relief and Reconstruction Efforts: The Emerging Pair-Wise Aid Mechanism

Mobilizing emergency disaster relief following the Wenchuan earthquake was a daunting task: the Chinese government underwent unprecedented and grave tests. Those three months and 20 days, from May 12 to September 2, the day when the Yingxiu–Wenchuan road was officially reopened, can be divided into five stages.

The first stage encompasses the emergency response, from May 12 to May 15. Basic measures that the Chinese government adopted to cope with the situation were as follows: on the afternoon of May 12, the government established a general earthquake relief headquarters for the General Office of the State Council, and it set up nine working groups.

The General Office of the State Council was responsible for (1) the organization of general headquarters meetings and special sessions convened by the general director or the deputy general director; (2) the collection, analysis, submission, and release of significant information; (3) the supervision of the way decisions made by the general headquarters were implemented; (4) the communication and coordination on important matters among relevant offices within local governments, departments, the People's Liberation Army (PLA), and Chinese Armed Police Force; and (5) the discharge of other matters assigned by the general headquarters.

The responsibilities, lead departments, and members of each of the nine working groups were divided as follows (China, Ministry of Civil Affairs, NCDR and UNDP 2009):

- **A rescue and relief group** to clean up the disaster-hit area, search for and rescue trapped and injured citizens, organize the self-help and mutual aid of grassroots cadres and the masses, and organize rescue personnel and air transportation, as well as oversee airdrops of relief material. The group was led by the Ministry of Public Security and included the State Administration of Work Safety (National Workplace Emergency Management Center), the China Earthquake Administration, and the Chinese Armed Police Force, as well as the Chengdu Regional Military Force.
- **A community life-rebuilding group** to develop and implement rescue plans for victims and related measures for the supply of funds and materials; guide local governments on emergency relocation; guarantee victims' basic livelihood and market access; accept and arrange domestic donations and international aid; and manage foreign affairs. The group was led by the Ministry of Civil Affairs and included the Ministry of Foreign Affairs, the National Development and Reform Commission (NDRC), the Ministry of Finance, the Ministry of Housing and Urban-Rural Development, the Ministry of Agriculture, and the Ministry of Commerce, as well as the Red Cross Society of China.
- **An earthquake monitoring group** to monitor earthquakes and prevent secondary disasters; assemble the necessary technical force and equipment for the close monitoring of seismic activity and all-out defense against aftershock; strengthen the monitoring and early warning of major geological disasters; organize the evacuation of people in the event of an emergency; enhance the monitoring of water quality and control of pollutants such as hazardous chemicals; and strictly ensure the safe operation of nuclear facilities. The group was led by the China Earthquake Administration and included the Ministry of Science and Technology, the Ministry of Land and Resources, the Ministry of Environmental Protection, and the China Meteorological Administration, as well as the Administration of Science, Technology, and Industry for National Defense.
- **An epidemic prevention group** to organize medical teams and assemble medical equipment and medicines for medical assistance, epidemic prevention, and treatment of the wounded; examine and monitor drinking

water sources and foods; and prevent and control the outbreak of epidemics. The group was led by the Ministry of Health and included the NDRC; the Ministry of Agriculture; the General Administration of Quality Supervision, Inspection, and Quarantine; the State Food and Drug Administration; the General Logistics Department; and the Chinese Armed Police Force.

- **A publicity group** to release relevant news and organize related reports on the disaster situation and earthquake relief information; notify the international community and Hong Kong, Macau, and Taiwan of updated information; release disaster information promptly and accurately; strengthen the collection and analysis of public opinions; and guide domestic and overseas opinion. The group was led by the Publicity Department of the Party Committee and included the Ministry of Foreign Affairs; the State Administration of Radio, Film, and Television (SARFT); the Taiwan Affairs Office of the State Council PRC; the State Council Information Office; the Hong Kong and Macao Affairs Office of the State Council; and the China Earthquake Administration.
- **A production resumption group** to assist in production and reconstruction, verify the damages and losses of all industries, guide and develop scientific plans for production resumption, and actively implement supportive measures by supplying funds and materials. The group was led by the Ministry of Industry and Information Technology and included the NDRC; the Ministry of Finance; the Ministry of Commerce; the Ministry of Human Resources and Social Security; the Ministry of Agriculture; the State-Owned Assets Supervision and Administration Commission (SASAC); the State Administration of Work Safety; the China Insurance Regulatory Commission; and the Administration of Science, Technology, and Industry for National Defense.
- **An infrastructure guarantee and post-disaster reconstruction group** to conduct emergency repairs and maintenance on railroads, highways, bridges, and tunnels as well as on other infrastructure, such as water supply, gas supply, and communications facilities. The group also organized and assembled rescue equipment, particularly disaster relief materials and medicines to effectively guarantee the supply of disaster relief materials in disaster-hit areas; coordinated transportation capacity for emergency earthquake relief personnel and relevant relief materials; organized and studied post-disaster reconstruction planning; and guided and

coordinated post-disaster reconstruction operations. The group was led by the NDRC and included the Ministry of Industry and Information Technology, the Ministry of Civil Affairs, the Ministry of Finance, the Ministry of Housing and Urban-Rural Development, the Ministry of Transport, the Ministry of Railways, the Ministry of Agriculture, SASAC, SARFT, the State Administration of Work Safety, the China Banking Regulatory Commission, the State Electricity Regulatory Commission, the State Post Bureau, the Civil Aviation Administration of China (CAAC), and the State Grid.

- **A water resources group** to ensure the security of reservoirs in disaster-hit areas, fix deformed riverways damaged by the earthquake, and ensure the safety of drinking water. The group was led by the Ministry of Water Resources and included the NDRC, the Ministry of Finance, the Ministry of Land and Resources, the Ministry of Environmental Protection, the Ministry of Housing and Urban-Rural Development, the Ministry of Health, the Ministry of Agriculture, the China Earthquake Administration, the China Meteorological Administration, the State Electricity Regulatory Commission, and the Operation Department of the General Staff.
- **A public security group** to strengthen security administration in disaster-hit areas; prevent and fight illegal and criminal activities; safeguard public security; maintain orderly traffic; strengthen security for Party and government organizations, key departments, financial institutions, and reserve warehouses; and safeguard social stability. The group was led by the Ministry of Public Security and included the Ministry of Education, the Ministry of Justice, the People's Bank of China, the China Banking Regulatory Commission, the China Securities Regulatory Commission, the National Tourism Administration, the State Bureau for Letters and Calls, and the Chinese Armed Police Force.

The above-mentioned system integrated the Party, the government, and the military at the central government level and served as the most effective disaster management system.

China's response was activated at the highest level: Premier Wen Jiabao arrived at the disaster-hit area on May 12 to command disaster relief operations; he was followed by Hu Jintao, then president of the People's Republic of China and chairman of the Central Military Commission, who arrived at the disaster-hit area on May 16. At the same time, governments at all levels in the

disaster-hit area started their own mobilization activities, establishing an integrated command system.

During this period, the central government invested a large amount of funds and dispatched more than 100,000 soldiers, particularly firefighters, into the disaster-hit area for emergency relief operations. Meanwhile, the central government launched a nationwide mobilization system for supporting operations and, for the first time since the founding of the People's Republic of China, initiated an international cooperation mechanism that allowed international rescue teams into the disaster-hit area. Besides this, the government established a mechanism to ensure information transparency by offering foreign journalists open access to interviewees in the disaster-stricken areas. The State Council Information Office also started to release a daily bulletin of information on the disaster-hit areas.

The State Council's earthquake relief general headquarters established its front headquarters in Sichuan on May 15 and appointed Vice Premier Hui Liangyu as the general director. Following this, the comprehensive coordination of disaster relief operations ran smoothly.

The second stage, from May 16 to May 31, involved comprehensive lifesaving operations and the temporary emergency relocation of victims. The challenge of resettling masses of victims from disaster-hit areas came to the fore. Meanwhile, rescuing and guaranteeing the safety of survivors trapped in collapsed buildings or in remote mountainous areas posed an even greater challenge. During this period, people all over the country and the international community donated huge quantities of relief materials for the emergency relocation of victims. Moreover, many volunteers arrived at disaster-hit areas for direct and immediate relief operations.

On May 19, the front headquarters designated the six provinces of Jiangsu, Zhejiang, Shandong, Guangdong, Hubei, and Henan to utilize their resources to directly aid five cities in Sichuan. After that, Sichuan asked the central government to help provide 3 million more tents. On May 22 the Ministry of Civil Affairs made the decision to establish the partner assistance model in which a specific province is assigned to help a disaster-stricken county; this streamlined relief processes and improved earthquake relief operations. Meanwhile, the central government carried out a living assistance policy by supplying 500 grams of food and RMB 10 to each victim on a daily basis from June to August; it also procured 900,000 tents in one month, as well as 1 million prefabricated houses, as temporary shelters for victims.

The third stage, from June 1 to June 26, involved addressing secondary disasters and the preliminary systematic relocation of victims. On the one

hand, barrier lakes, particularly Tang Jiashan Barrier Lake, posed a threat to disaster relief work. On the other hand, with the gradual clearing and opening of roads, relief materials were continuously transported into disaster-hit areas, the disaster relief mechanism began to be established in a systematic way, and the government integrated restoration and reconstruction into its schedule.

The State Council issued the Regulations on Post-Wenchuan Earthquake Rehabilitation and Reconstruction on June 8, thereby regulating rehabilitation and reconstruction operations by law. On June 12 the Ministry of Civil Affairs, the Ministry of Finance, and the Ministry of Housing and Urban-Rural Development jointly issued guiding opinions on the reconstruction of victims' houses. The central government would grant a subsidy of RMB 10,000 to each family whose house had collapsed or been seriously damaged for reconstruction. As a result, the central government allocated RMB 40 billion as reconstruction funds. On June 13 the CPC Central Committee and State Council convened a meeting of principals of all provinces, autonomous regions, and municipalities, as well as central departments, and made the decision to formulate assistance plans according to the pair-wise province-to-county aid model.

The Standing Committee of the National People's Congress listened to the report on the earthquake relief work of the State Council on June 24 and approved the establishment of the national post-disaster restoration and reconstruction fund on June 26 to guarantee related reconstruction efforts. On June 10, the hidden danger posed by the Tang Jiashan Barrier Lake was successfully eliminated, and the discharged flood peak passed by Mianyang urban district smoothly without causing any casualties. In addition, by June 21 a total of 1,570,000 tents, 4,860,000 quilts, and 14,100,000 items of clothing had been disbursed to the disaster-stricken area. Furthermore, governments at all levels had invested RMB 54.3 billion, including 49.6 billion from the central government and 4.7 billion from local governments. As a result, each family affected by the earthquake had access to a temporary dwelling.

The fourth stage, from June 27 to July 18, involved the deepening of all disaster relief policies and the further relocation of those affected by the earthquake. It became apparent that funding sources would need to be identified for the various restoration and reconstruction policies. Therefore, during this period, the top priority was to formulate major policies on recovery and reconstruction.

On June 29, the State Council issued the Opinions of the State Council on Policy Measures for Assistance in Post-disaster Recovery and Reconstruction after the Wenchuan Earthquake so as to carry out further reconstruction

work. The Opinions set forth specific provisions on the policy for post-earthquake recovery and reconstruction funds; these provisions related to policies on central finance, financial expenditure, taxation, use of government funds and revenue from administrative and institutional fees, industrial support, land and mineral resources, employment assistance and social insurance, and food, as well as many other matters.

The Ministry of Civil Affairs, the NDRC, the Ministry of Finance, the Ministry of Land and Resources, the China Earthquake Administration, and the National Committee of Experts for the Wenchuan Earthquake completed an Earthquake Disaster Range Assessment jointly with the provincial governments of Sichuan, Gansu, and Shaanxi on July 11. The Assessment for the disaster range of the Wenchuan earthquake found the following: 417 counties (a county encompasses either a city or a district) were affected by the earthquake, including the 10 very worst-hit counties (cities), 36 worst-hit counties (cities, districts), 191 disaster-hit area counties (cities, districts) as well as 180 affected area counties (cities, districts). The entire affected area was 500,000 square kilometers, including 26,000 square kilometers of the very worst-hit area entirely located in Sichuan province, 90,000 square kilometers of worst-hit area, and 384,000 square kilometers of disaster-hit area.

This assessment laid a solid foundation for related restoration and reconstruction planning. Policies were also made for living arrangements for the people in the disaster-hit areas. On July 18, the Ministry of Civil Affairs and Ministry of Finance issued the Notification on Matters Concerning Subsequent Life Assistance to the Needy in Areas Struck by the Wenchuan Earthquake in order to provide further assistance for orphans, solitary elderly people, solitary disabled people, poor family members of the deceased and the seriously disabled, internally displaced persons, and those whose houses had collapsed or were damaged in the earthquake. This relief policy lasted for three months, from September to November. Subsequently, cash, instead of provisions, would be provided to the victims at a monthly rate of RMB 200 per capita. Upon the expiration of such a relief policy at the end of November, for victims in need, different relief policies would apply according to different circumstances. These relief policies included basic cost-of-living allowances for urban and rural residents and, in rural areas, the existing “Five Guarantees” social assistance system (which ensures the provision of food, clothing, housing, medical care, and a proper burial for the neediest in rural areas).

The fifth stage, from July 19 to September 2, involved the systematic establishment of post-disaster recovery and reconstruction mechanisms at both the central and local government levels and the comprehensive implementation

of all policies. During this stage, as the road from Yingxiu to Wenchuan was not yet reopened, one had to make a long detour to get to western and northern Sichuan, which hampered the relief work. The situation was further aggravated in the rainy summer, which caused occasional regional flooding. However, this was a critical period for recovery and reconstruction. Greater efforts had to be made to work out concrete overall plans for recovery and reconstruction.

The road from Yingxiu to Wenchuan finally reopened on September 2, thereby restoring the direct connection between Ngawa Tibetan and Qiang Autonomous Prefecture and the entire Chengdu Plain. Furthermore, the governments in Gansu and Shaanxi also started to conduct systematic planning of post-disaster rehabilitation and reconstruction activities.

On September 19, 2008, the State Council officially issued the Overall Plan on Post-Wenchuan Earthquake Rehabilitation and Reconstruction for the unified deployment of post-disaster rehabilitation and reconstruction forces. On October 8, the CPC Central Committee, the State Council, and the Central Military Commission jointly convened a national commendation conference for earthquake relief, representing the end of the basic phase of emergency earthquake rescue operations.

On May 19, the front headquarters designated the six provinces of Jiangsu, Zhejiang, Shandong, Guangdong, Hubei, and Henan to use their resources to directly aid five cities in Sichuan on a one-to-one basis. At that time, Jiangsu was designated to aid the worst-hit Shifang and Mianzhu cities within Deyang municipality; Zhejiang was designated to aid the prefecture-level Guangyuan city, particularly Qingchuan County within the Guangyuan Prefecture; Shandong and Henan were designated to aid several cities and counties of the worst-hit Mianyang city (another prefecture-level city), such as Beichuan, Pingwu, and Jiangyou; Guangdong was designated to aid Ngawa Tibetan and Qiang Autonomous Prefecture, particularly Wenchuan County; and Hubei was designated to aid the prefecture-level Ya'an city, particularly Hanyuan County.

The establishment of the pair-wise province-to-county aid model was imperative because of the limited post-disaster logistical capabilities. For example, the Chengdu Railway Station has a maximum daily handling capacity of 300 cars during ordinary conditions. During the disaster relief period, the capacity could be increased to 700 or even 1,000 cars per day. However, during the first week after the Wenchuan earthquake, more than 2,000 cars of materials had to be transported into Sichuan on a daily basis, posing a logistical challenge.

Similar problems were encountered at the Chengdu Airport, where the supply of diesel for cargo handling machines ran out because of the huge amount of materials being handled. Consequently, numerous volunteers were relied on for the manual unloading of relief materials. In addition, many drivers transporting disaster relief materials from Chengdu to other disaster-hit areas had gone a week without rest, which was, needless to say, dangerous. In addition, officials in charge of the disaster relief operations in Dujiangyan demanded that trucks full of relief materials from other provinces unload the materials directly in Dujiangyan instead of Chengdu for convenience. However, aid personnel rejected the dictate and insisted on transporting materials into Chengdu in accordance with procedures.

At that time, it was clear that an administrative logjam had occurred in the Wenchuan earthquake relief efforts because traditional administrative systems, experience, and operational channels were no longer sufficient. The author reported these problems to the general director of the front headquarters, Vice Premier Hui Liangyu. As a result, Vice Premier Hui Liangyu decided to take actions to overcome such barriers in the administrative system.

The vice premier invited the six provinces to provide direct assistance to the five cities. He made a call to the secretary of the Provincial Committee of the CPC and asked the minister of civil affairs to call the head of Sichuan's Department of Civil Affairs to implement his decisions. This chapter's author, who was serving as director of the disaster relief department of the Ministry of Civil Affairs and director of the National Disaster Reduction Center, was then made responsible for the coordination work.

At that time, only a disaster relief commissioner from the Ministry of Civil Affairs disaster relief department and an official from the emergency department of the National Disaster Reduction Center worked with me at the front headquarters. Because the Department of Civil Affairs was responsible for the organization of the relief work, the three of us acted as liaisons with the department. Our coordination work proved to be challenging, as reports had to be made to the Department of Civil Affairs of Sichuan, and we needed to communicate with local leaders to make sure that staff from all six provinces carried out assistance directly to the quake-hit cities and counties and that reception personnel were available for the implementation of the plans at the city level.

The pair-wise province-to-county aid model was designed to offer direct aid to disaster-hit areas and to simplify lengthy and redundant administrative procedures. As can be seen in the relief effort overview above, the establishment of the pair-wise province-to-county aid model was a process involving

continuous exploration and improvement. The next section describes the learning process in depth.

The Formulation and Implementation of the Pair-Wise Aid Policy

Although the effectiveness of the pair-wise aid policy was proved by successes such as those experienced between Hubei and Ya'an, new challenges and problems arose on May 22, three days after the implementation of the new model. For example, complications arose with the aid to Mianyang and Deyang. At that time, Shandong and Henan were designated to aid Mianyang. However, the system was set up such that relief materials could not be divided up until they reached Mianyang city, so all of these materials were transported directly to Mianyang city instead of being distributed to other assigned recipients, such as Jiangyou County, along the way. As a result, Henan then had to transport relevant materials back to Jiangyou County, resulting in a significant waste of time and logistical resources. The deputy director-general of the Department of Civil Affairs of Henan Province, who was in charge of the related work, asked if measures could be taken to avoid such inefficiency.

Meanwhile, the working group from Jiangsu was faced with similar challenges in Deyang. At first, Jiangsu Province planned to designate Suzhou city and Wuxi city to directly aid Shifang and Mianzhu on a one-to-one basis. The idea was adopted, and disaster relief coordinators led the working group of Jiangsu to report to Vice Premier Hui Liangyu. However, three days later, disaster relief coordinators got news of challenges. For example, the two recipient cities debated about where the Jiangsu earthquake relief headquarters should be located, how much aid each city should receive, and when they should get the aid, and Jiangsu Province was unable to resolve these issues. Afterward, Sichuan required the central government to provide 3 million more tents. However, after performing independent calculations, those working in the front headquarters provided a more accurate estimate of 1 million tents.

In the meantime, the State Council demanded that a detailed plan be carried out for the distribution on a one-to-one basis of millions of prefabricated houses to the disaster-hit area. On the morning of May 21, all major leaders accompanied Premier Wen Jiabao on his visit to the disaster-hit area. During this visit, the director-general of the Department of Civil Affairs of Hebei Province suggested that the assistance of counties on a one-to-one basis would

BOX 3.1 Disaster Management Experience with Typhoon Saomai

Typhoon Saomai, which landed at the junction between Zhejiang and Fujian at 17:25 on August 10, 2006, was a type of typhoon rarely seen before. It developed right on the heels of Typhoon Maria and Tropical Storm Bopha on the surface of the western Pacific Ocean, with the three mercurial typhoons further reinforcing one another and gradually building up a devastating power between them. The time the typhoon landed happened to coincide with high tide, and the confluence of wind, rain, and tide only made the situation more menacing.

Saomai, which slammed into Fujian with its peak wind speed hitting 75.8 meters/second, registered a maximum wind force of Force 17 on the Beaufort scale. This put it in the category of Hurricane Katrina, which pounded New Orleans. According to relevant statistics collected by Fujian on August 16, 14 counties and 164 towns within the province were affected, with a population of 1.45 million: 45,700 houses collapsed, 215 people were killed, and 157 people were missing.

A large number of ships were sunk, the worst case being at the Shacheng port in Fuding city, where 952 ships sank and 1,139 were damaged. Crop-land of 68,800 hectares was affected, with 44,230 hectares destroyed; 234 industrial and mining enterprises were forced to close, with the direct economic loss reaching RMB 6.357 billion (Baidu Encyclopedia n.d.).

Almost immediately following the devastating typhoon, Fujian put in considerable relief efforts; the provincial party chief and governor both showed up at the frontline of relief efforts. However, because the disaster had dealt a devastating blow to communications, electricity, and transportation, many reporters couldn't get comprehensive and accurate information, so they wrote negative news reports, causing a great deal of misunderstanding within the society.

This chapter's author was directly involved in the handling of this incident and since then has continued to consider one issue: how to conduct a rescue after a devastating disaster hits a region. Local government alone is by no means capable of handling massive disasters, and the direct intervention of the central government, including the provision of rescue armed forces and specialized equipment, is imperative.

Even more important is the adoption of a coordinated but decentralized system, which is not unprecedented in the international rescue and relief community. Actually, in international rescue and relief practice, especially the relief operations following the 2004 Indian Ocean tsunami, the few participating countries all acted relatively independently yet also collaboratively under certain circumstances. Such experience with direct rescue provided inspiration for the Wenchuan earthquake relief efforts.

be more convenient and effective. At that time, Hebei Province had established contact with Chongzhou and wished to aid it specifically.

Given past experiences with other disasters (Box 3.1) and the realities on the ground, a notice was drafted on May 21 and sent to Beijing for modification. On May 22, the Ministry of Civil Affairs issued the Emergency Notice on Specific One-to-One Aid for Affected Areas of the Wenchuan Earthquake. The first line in the Notice read “according to the overall deployment of the general earthquake relief headquarters for the State Council on one-to-one aid work”; this line demonstrated that one-to-one aid work had gradually become the general consensus.

As it had become clear that the scale of the reconstruction required would exceed the capacity of the six provinces initially assigned, the list of both donors and recipients was expanded to include 21 donor-recipient pairs, as follows: Beijing-Shifang, Shanghai-Dujiangyan, Hunan-Pengzhou, Heilongjiang-Wenjiang district, Shanxi-Pi County, Inner Mongolia-Dayi County, Hebei-Chongzhou, Jiangsu-Mianzhu, Liaoning-An County, Shandong-Beichuan County, Jilin-Pingwu County, Henan-Jiangyou, Guangdong-Wenchuan County, Fujian-Li County, Tianjin-Mao County, Anhui-Songpan County, Jiangxi-Xiaojin County, Guangxi-Heishui County, Zhejiang-Qingchuan County, Hubei-Hanyuan County, and Hainan-Baoxing County. In addition to the pair-wise relief efforts for affected parts of Sichuan, the notice designated Beijing and Tianjin to aid Longnan and Gannan of Gansu Province, respectively. And donations from Guizhou, Tibet, Qinghai, Ningxia, Xinjiang, and the Xinjiang Production and Construction Corps that were not assigned to specific aid missions were used mainly for the living arrangements of victims and the rehabilitation and reconstruction of the affected area of Shaanxi Province.

The Emergency Notice was carried out urgently and ignored regular administrative orders. Afterward, some people, even a few officials in Sichuan Province, had doubts about whether the determination procedures used for producing the notice were legal, whether the decisionmakers responsible for this notice had the authority to draft it, and whether aid-providing areas had been paired to the correct aid-receiving areas.

In fact, the list was formulated through in-depth consultation with the Department of Civil Affairs of Sichuan Province and members of the Sichuan earthquake relief headquarters. Nonetheless, the information provided to those who were overseeing disaster relief efforts was limited at that time, and they were able to adhere to the list only for the time being.

The issuance of the document by the Ministry of Civil Affairs served to disseminate the Ministry's rich experience and effective administrative procedures. Furthermore, Jiangsu, Zhejiang, Hubei, Shandong, Henan, and Guangdong needed to shift their focuses in accordance with this notice to guarantee the successful completion of their respective missions and the comprehensive handover of the relevant work.

The Emergency Notice identified the primary missions of the aid-providing provinces to be as follows:

1. To provide temporary shelters for victims, including tents, prefabricated houses, and transitional makeshift houses, and to strive to offer a temporary dwelling for each relocated family
2. To provide cotton quilts, clothes, food, and drinking water, as well as household items such as cooking utensils and beds, to meet the basic needs of victims
3. To assist the relevant local governments of disaster-hit areas in rehabilitation and reconstruction operations such as the reconstruction of civilian houses and the renovation of infrastructure
4. To assist the relevant local governments of disaster-hit areas in the recovery and development of the economy, including economic cooperation and technical guidance

The above-mentioned missions are related to the disaster relief work of the Ministry of Civil Affairs, because of its guiding role in the disaster relief work and the post-disaster rehabilitation and reconstruction. Both aid-providing and aid-receiving provinces were also required to carry out four other tasks identified in the notice.

First, they needed to deepen their understanding of and attach greater importance to disaster relief work. All levels of civil affairs departments had to resolutely implement instructions on the pair-wise province-to-county aid model of the Party Central Committee and State Council, fully realize the extreme importance and urgency of one-to-one disaster relief work, understand the urgent demands of disaster-hit areas, organize emergency mobilization, regard one-to-one disaster relief work as a top priority, and achieve practical results.

Second, these provinces needed to enhance communication and work in close collaboration. Each assisting province and disaster-hit area would establish a special working group and select backbone personnel with both political

integrity and professional competence for full-time disaster relief work. An assistance province and corresponding disaster-affected area would establish a direct contact and collaboration mechanism to ensure the smooth implementation of relevant disaster relief operations.

Third, the provinces needed to pinpoint specific demands and determine corresponding tasks. Each disaster-hit area would report its prioritized requirements to the corresponding province. Each assisting province would determine its tasks and relevant time constraints and organize the production and allocation of the required materials on time and in accordance with the actual demands of the disaster-hit area. The priority was to provide sufficient tents, quilts, clothes, food, and drinking water, as well as household items such as cooking utensils and beds, to the disaster-hit area. Provincial governments would assign special personnel to enterprises designated by the Ministry of Civil Affairs to manufacture relief tents. These special personnel would supervise and inspect the scheduling and coordination of production and would settle any production and transportation difficulties in order to ensure the timely completion of relevant production missions.

Fourth, these provinces would carry out recovery and reconstruction on the basis of the present situation but informed by a long-term view. In addition to livelihood assistance to the victims, aid providers should provide them with both technical and financial support for engineering construction and the design of urban and rural planning. Meanwhile, plans for recovery and reconstruction in earthquake-hit areas would be worked out as quickly as possible and integrated into post-disaster reconstruction and the longer-term sustainable economic development of the earthquake-hit areas, especially in the case of infrastructure development, so as to enable the growth of locally appropriate industries.

These requirements were proposed in accordance with the specific circumstances of the general disaster relief operations. After the issuance of the notice, those overseeing the relief efforts visited Shifang and Dujiangyan immediately. People in the disaster-hit area were pleased and inspired. Dujiangyan even issued extra leaflets as a welcome to the working group from Shanghai.

However, the local officials of Shifang were dissatisfied with the new decision because they had to abandon their work with Guangdong on projects worth tens of millions of RMB, as Guangdong was designated to aid Wenchuan County. At that time, the Beijing support team was still in another place, but the officials of Shifang were told that Beijing would send its personnel and materials to Shifang soon. Nevertheless, Beijing dispatched one of its

deputy mayors to Shifang the same day to learn about supply requirements. Soon afterward, Beijing organized 80 train cars of relief materials and quickly transported them into Shifang, largely resolving the most urgent problems in Shifang.

Since the establishment of the pair-wise province-to-county aid model, all the paired provinces and cities had set up their own front headquarters, thereby standardizing national earthquake relief operations. With the help of this new model, earthquake relief processes were streamlined, and relief operations were effectively improved.

Upon stabilizing emergency relief, restoration and reconstruction were brought onto the agenda. However, the central government faced a challenge in effectively and efficiently carrying out restoration and reconstruction across such an extensive area as that which was affected by the Wenchuan earthquake. Therefore, the Political Bureau of the CPC Central Committee convened a meeting on June 5 to examine and assess the implementation of the partner assistance model of pairing a province with a county during the post-disaster restoration and reconstruction.

In fact, prior to the meeting held by the Political Bureau on June 5, the partner assistance model had never been mentioned in the documents issued by the State Council. A majority of people thought that the institutional arrangement was made by the Ministry of Civil Affairs, while some even believed (mistakenly) that it was carried out by the Ministry of Civil Affairs without the approval of the State Council. With the Political Bureau's decision to implement the partner assistance model, it became a comprehensive national-level institutional arrangement.

At a meeting held on June 11, the CPC Central Committee decided that the partner assistance model that paired a province with a county would be put into practice comprehensively. According to the requirements laid out by the CPC Central Committee, money and materials annually donated by the provinces providing partner assistance should be no less than 1 percent of their local government revenues for the previous year. Later on, a formal system of partner assistance was set up, in which 18 provinces were assigned to assist 18 cities and counties in Sichuan Province, Tianjin Province was assigned to assist Shaanxi Province, and Shenzhen Province was assigned to assist Gansu Province.

This institutional arrangement was actually made by a higher level of management, that is, the CPC Central Committee rather than the Ministry of Civil Affairs. The arrangement made by the Ministry of Civil Affairs wasn't necessarily appropriate because it was made during the emergency relief

TABLE 3.1 Pairs of aid providers and recipients, Sichuan earthquake response

Aid Provider	Aid Recipient
Guangdong Province	Wenchuan County
Shandong Province	Beichuan County
Zhejiang Province	Qingchuan County
Jiangsu Province	Mianzhu city
Shanghai city	Dujiangyan city
Beijing city	Shifang city
Henan Province	Jiangyou city
Hebei Province	Pingwu County
Liaoning Province	An County
Fujian Province	Pengzhou city
Shanxi Province	Mao County
Hunan Province	Li County
Jilin Province	Heishui County
Anhui Province	Songpan County
Jiangxi Province	Xiaojin County
Hubei Province	Hanyuan County
Chongqing city	Chongzhou city
Heilongjiang Province	Jiange County
Guangdong Province (mainly, Shenzhen city)	the worst-hit areas in Gansu Province
Tianjin Province	the worst-hit areas in Shaanxi Province

Source: China, State Council (2008b).

period. For example, Heilongjiang Province was originally assigned to assist Wenjiang district, which turned out to be suffering less damage than other areas. To further improve the partner assistance system, necessary adjustments were inevitable. Table 3.1 shows the new arrangements that followed these adjustments.

Although most of the arrangements were the same as those during the emergency relief period, some major changes were made to partner assistance arrangements. For example, former arrangements for Heilongjiang Province, Shanxi Province, Hebei Province, and Tianjin Province, as well as some other provinces were changed, and relatively poor provinces, including Inner Mongolia and Guangxi Province, were no longer on the partner assistance list. And Tianjin Province and Shenzhen city, which are economically powerful, were assigned to assist Shaanxi Province and Gansu Province in their post-disaster restoration and reconstruction.

In order to motivate the efficient and effective implementation of the partner assistance mechanism, the CPC Central Committee designated it as a priority task and one that would be standardized. Standardization serves to facilitate measurement and comparison and thereby triggers competition among officials of the donor provinces, who operate within China's tournament-style bureaucratic system in which promotion depends on excelling in meeting goals (Zhong and Lu 2015). Transparency of public opinion and the supervision of auditing departments also contributed to the success of the assistance program as a whole (Fengyangxiaozhu 2011).

To carry out the comprehensive restoration and reconstruction and to help with the implementation of Beijing's partner assistance to Shifang, a national restoration and reconstruction system was developed under the leadership of the NDRC, with assistance from the Sichuan Provincial People's Government and Sichuan Department of Housing and Urban-Rural Development. The system's members included the following:

- Shaanxi Provincial People's Government
- Gansu Provincial People's Government
- Ministry of Education
- Ministry of Science and Technology
- Ministry of Industry and Information Technology
- State Ethnic Affairs Commission
- Ministry of Public Security
- Ministry of Civil Affairs
- Ministry of Finance
- Ministry of Human Resources and Social Security
- Ministry of Land and Resources
- Ministry of Environmental Protection
- Ministry of Transport
- Ministry of Railways
- Ministry of Water Resources
- Ministry of Agriculture

Ministry of Commerce

Ministry of Culture

Ministry of Health

National Population and Family Planning Commission

People's Bank of China

State-Owned Assets Supervision and Administration Commission of the State Council

State Administration of Taxation

General Administration of Press and Publication

State Administration of Radio, Film, and Television

General Administration of Sport of China

State Forestry Administration

China National Tourism Administration

Chinese Academy of Sciences

Chinese Academy of Engineering

China Earthquake Administration

China Meteorological Administration

China Banking Regulatory Commission

China Securities Regulatory Commission

China Insurance Regulatory Commission

State Electricity Regulatory Commission

National Energy Administration

State Administration of Cultural Heritage

State Food and Drug Administration

State Council Leading Group Office of Poverty Alleviation and Development

Many other ministries and departments were involved. The national mobilization system was rather effective as a result of this structural arrangement.

In addition, the partner assistance offered by provinces previously assigned by the Ministry of Civil Affairs was still carried out. Hainan Province was originally designated to help Baoxing County, Sichuan Province. Though neither Hainan nor Baoxing was listed among the emergency aid providers or recipients, they maintained their partner assistance relationship because Hainan had about RMB 100 million in donor funding. Relatively poor areas such as Qinghai, Xinjiang, and Tibet also delivered their donor funds to the disaster-hit areas.

The general layout of the pair-wise province-to-county aid model generated great political, economic, and social benefits and further enhanced social cohesion. Restoration and reconstruction in disaster-hit areas also helped to promote innovations in public governance. In a system dominated by ideas of vertical management, in which initiative proceeds from higher to lower levels of the hierarchy (from the central government to a provincial government) or horizontal management, in which initiative proceeds from one manager to another at the same hierarchical level (from one bureau to another or from one province to another), networked systems and relationships have created new management opportunities. The new networked system allows, for example, one province to initiate a relationship with a county in a different province. As for the achievements of the pair-wise province-to-county aid approach, in a press conference organized by the Information Office of the State Council on May 10, 2011, the deputy director of the National Development and Reform Commission noted that the innovative partnership program had made outstanding contributions to speeding up the reconstruction campaign, enhancing reconstruction quality, and raising the reconstruction level.

By the end of September 2010, the post-disaster restoration and reconstruction campaign had generally achieved the goal of “completing a three-year mission in two years.” Currently, nearly 95 percent of the total number of the planned post-disaster reconstruction projects have been completed. Three provinces have built 1,908,500 rural housing units, 288,300 urban housing units, 3,839 schools, 2,169 health and rehabilitation organizations of all types, and 5,000 infrastructure projects of all types, which amounts to a decisive victory in post-disaster recovery and reconstruction.

Some of the most heavily hit counties, townships, and villages, including the “Three Chuans” (Wenchuan, Beichuan and Qingchuan) and “Two Townships” (Yingxiu township and Hanwang township), have been impressively reborn and are now reemerging with a whole new look. Priority has been

TABLE 3.2 Assistance funding and projects by partner, Sichuan earthquake response

Partners	Funding (million RMB)	Number of projects
Guangdong Province–Wenchuan County	11,200	702
Shandong Province–Beichuan County	12,000	369
Zhejiang Province–Qingchuan County	8,500	538
Jiangsu Province–Mianzhu city	11,000	295
Shanghai city–Dujiangyan city	8,250	117
Beijing city–Shifang city	7,000	108
Henan Province–Jiangyou city	3,002	302
Hebei Province–Pingwu County	2,800	108
Liaoning Province–An County	3,400	88
Fujian Province–Pengzhou city	4,734	143
Shanxi Province–Mao County	2,162	226
Hunan Province–Li County	2,010	99
Jilin Province–Heishui County	1,297	201
Anhui Province–Songpan County	2,130	320
Jiangxi Province–Xiaojin County	1,300	51
Hubei Province–Hanyuan County	2,115	116
Chongqing city–Chongzhou city	1,700	111
Heilongjiang Province–Jiange County	1,550	146
Tianjin Province–Shaanxi Province	2,237	121
Shenzhen city–Gansu Province	3,000	165
Total	91,387	4,326

Sources: Zhou (2010a), Mu and Sha (2010), Shen (2011), Jiangsu Provincial Audit Office of China (2011), Hua (2011), Chen (2010), Geng (2010), Yang and Ma (2010), Fujian Pairwise Aid Post-Disaster Reconstruction Penzhou Front Headquarters (2011), G. Li (2011), L. Li (2011), Wang (2011), Anhui Province's Songpan County Assistance Office (2011), Aba Prefecture (2010), Yong and Wang (2010), Chen (2011), Zhang (2011), Yang and Chi (2010), Zhou (2010b), Cheng (2010).

given to the completion of urban and rural housing units, schools, hospitals, and public infrastructure projects, while other specially planned projects have also entered their final phase.

The number of assistance projects and amount of aid funds involved make it clear that the post-earthquake recovery campaign has enhanced the infrastructure of the affected areas. The total amount of assistance funds contributed by all assistance-giving provinces and municipalities reached RMB 91.387 billion, with a total of 4,326 projects of all sizes undertaken (Table 3.2).

These numbers are only part of the evidence for the power of the partner assistance model. Because provinces and cities concentrated their efforts on helping rebuild their partners, “a three-year mission can be achieved in two years.” The whole society has thus fully realized the institutional advantages of letting large places help small ones. After that, it’s only natural for the central government to adopt the one province–one county approach in making partner assistance arrangements for certain places, especially the Xinjiang Autonomous Region.

Institutional Context for the Pair-Wise Aid Policy

The one province–one county disaster relief model provides an innovative strategy in which each province partners with a particular county and offers targeted assistance, thereby ensuring that all affected counties receive comprehensive assistance. All relevant provinces first have specialized working bodies stationed in their counterpart counties and then make further arrangements to partner their eligible cities or districts with particular affected townships—financially well-off counties under their jurisdiction extend assistance all the way down to the village level.

Such a practice of breaking down and assigning the assistance tasks level by level and exercising centralized control over large assistance projects affirms the government’s basic approach of “performing centralized deployment and breaking down tasks.” It’s worth noting here that this institutional innovation is also partly inspired by international experience. As the person who first directly promoted the establishment of the direct assistance system, the chapter author drew inspiration from the rescue and relief efforts following Typhoon Saomai that struck Fujian in 2006, as discussed in Box 3.1.

The pair-wise province-to-county aid model is essentially a structural shift whereby assistance decisionmaking no longer has to be passed down from the central government all the way through the Sichuan provincial government to Chengdu, Mianyang city, Deyang city, Ngawa Tibetan and Qiang Autonomous Prefecture, or Ya’an, and so on. Instead, direct interaction can be established between the government of the donor and the government of the affected recipient counties.

The pair-wise province-to-county aid model is a major institutional innovation. It aims to promote competition among relevant provinces so as to hone their respective capabilities through a mutual learning process. However, the role of the central government cannot be ignored. The central government’s

overall coordination and supervision ensures that a clear division of labor has been achieved among various places.

The pair-wise province-to-county aid model demonstrates the room for reform within the government's administrative system. In fact, even if the current system is not reformed but certain administrative behaviors are adjusted, considerable organizational opportunities can still be created. In other words, decentralization may well determine the degree to which the institutional efficiency is improved.

The establishment of the one province-one county system is a gradual process. At the initial stage, the system has no clear goals to speak of, and every step is merely driven by the most urgent need so that pressing problems can be promptly addressed. However, once it is in practice, the system can operate with great vitality and can immediately show its tremendous influence.

The establishment and smooth operation of the one province-one county disaster relief system requires some unique political and social conditions. These include the following:

First, a relatively sound disaster relief system must be in place. The four-level emergency response system China set up requires the central government's disaster relief officials to arrive at the affected areas and mobilize relief supplies and funds within 24 hours. This institutional guarantee is the prerequisite for the one province-one county direct relief system to function.

Before the Wenchuan earthquake, the four-level emergency response system had already been operating effectively for a few years. In March 2008, the Sichuan Provincial Civil Relief officials had just undergone a relevant training program in Zhuhai city, organized by the Ministry of Civil Affairs, and had since become well acquainted with the disaster relief system. That's why the partner assistance model could be readily adopted. In other words, for the model to work most effectively a proper system must be in place, and some officials must be familiar with the necessary procedures and know what to do in the event of an emergency.

Second, a strong mobilization capacity and a transparent system of public opinion must be in place. China's mobilization capacity can readily apply focused efforts nationwide on rescue and relief work during the relief period. In particular, when the central government required the local governments to donate 1 percent of their provincial budgets to support disaster relief and recovery, everything ran smoothly, without many institutional barriers in the way. Equally important, China's top leaders personally headed to the affected areas to see the situation on the ground with their own eyes and get to know the difficulties firsthand before they determined courses of action.

In addition, it's important to nurture a transparent news system. For instance, the practice of allowing foreign journalists free access to the disaster area to report on the progress of disaster relief may promote fair competition between them and their Chinese counterparts. This competition is a good thing, because in the absence of oversight by public opinion, large-scale tragedies like 1958's Great Leap Forward, with its foolhardy sky-is-the-limit philosophy, might reoccur.

The oversight of public opinion helps enhance the quality of the information transmitted so that the government can get prompt and accurate information on relief progress and problems in various places and make the best-informed and soundest relief and recovery decisions. Following the Wenchuan earthquake, media openness played an important role in the rescue and reconstruction by stimulating donations, drawing attention to corruption, and enabling mass collaboration in finding people.

As for the pair-wise aid mechanism, some policymakers initially intended to fulfill the task only by building 1 million prefabricated housing units. But in the implementation process, they realized that the construction of prefabricated houses may damage the rice fields; in addition, because of the mountainous location, the amount of land available to serve as reconstruction sites was limited. And the relatively short cycle of China's reconstruction effort meant that there was no need to learn—from Japan, for instance—about building modular houses for long-term use. The Qingchuan County party chief explained his view of the situation: "Our county only has 8,000 acres of arable land, and if all is used for building modular houses, what will my people eat in the future?" But obviously he alone couldn't change the decisions made by his superiors. In fact, it was public opinion that finally led to the adjustment of the modular house construction plan. The original task of blindly building 1 million modular houses was called off.

Third, an open system must be in place, informed by the power of charity. Institutional openness implies openness both to external influences and to certain internal elements. The Wenchuan earthquake relief operations were open to the outside world and to Chinese society, as well as to internal institutions. For example, the Recovery and Reconstruction Training Course for Local Leaders Going Abroad for Study, which was organized by the Organization Department of the CPC Central Committee, invited policymakers behind the formulation of the partner assistance policy to deliver a lecture to the participants about the importance of the policy and the relevant key issues to consider.

Though not responsible for the disaster relief work, the Organization Department of the CPC Central Committee has also played an important role in promoting the pair-wise province-to-county aid policy. Additionally, the power of charity should not be underestimated. During the Wenchuan disaster relief process, social consciousness in China was aroused to a considerable height, such that even beggars joined the ranks of donors. At the time, mobilizing additional support for the disaster relief efforts was easy, as most areas expressed the wish to join the rescue and relief operations in an orderly and effective manner.

In fact, participating provinces and municipalities all held special conferences commending their workers who engaged in recovery and reconstruction work. The workers regarded the rescue and relief mission as their own missions, all showing a strong sense of morality. The Wenchuan earthquake disaster relief operations indeed inspired the moral enthusiasm of the whole society and changed the public perception of youths as being deficient in social responsibility. Indeed, the post-1980s generation made an impressive debut during the relief period of the disaster. This sense of responsibility was a good social foundation upon which to implement the one province—one county model.

The practice of partnering a province with an affected county has played a strong role in enhancing social cohesion. A vertical system meets a horizontal system, resulting in networked functions. Of course, as an important innovation of the emergency response system, the pair-wise mechanism can't be used too often in daily administration. The one province—one county model has certain limitations, as described in this chapter. However, the one province—one county model has inspired some new insights concerning institutional construction and reform. The enhanced topic of institutional construction and reform serves as a whole new area for interested researchers to explore and draw on. With this in mind, the final section presents some initial findings regarding the implications of the pair-wise aid policy, as well as insights on its future development and implementation.

Conclusion

The pair-wise aid model has been widely characterized as a success. Chen and Booth (2011) note that the use of the pair-wise assistance mechanism following the Wenchuan earthquake supported the government's long-term strategy by optimizing the allocation of resources, upholding the principle of

coordinated regional development, and establishing a model for future disaster response efforts.

Xu and Lu (2013) conducted a study that compared the pair-wise mechanism with other aid models and found the pair-wise model to have been feasible and effective (citing its implementation a second time following the 2010 Yushu earthquake) and to have a number of advantages. Xu and Lu (2013) also found the pair-wise model to be more efficient and effective than other typical mechanisms—such as central government-oriented aid, national nongovernmental organization aid, and international humanitarian aid—with efficiency and effectiveness being measured by such metrics as assistance scope, support forms, and organizational coordination.

Criticisms of the mechanism, however, have also emerged in the research literature and popular press. For example, one *China Daily* reporter cited problems ranging from construction delays to misuse of funds and decreasing trust of public officials, as well as labor issues, in a story describing the progress of the reconstruction policy (Hu 2010). Xu and Lu (2013) and IRP (2010) note several problems with the pair-wise model, including power asymmetry between the donor and the recipient and exclusion of other organizations, such as NGOs and community organizations. Excluding community organizations led to cultural barriers and recipient inconvenience and dissatisfaction because of a lack of local experience and cultural knowledge. In addition, Xu and Lu (2013) note that the performance-oriented setup of the mechanism led to a preference for short-term infrastructure projects over other projects that could better alleviate poverty, as the latter type of project involved investments that were generally larger and more long-term. Furthermore, the disparity between the financing provided by various donor provinces and municipalities (with some donors providing several times as much as others) has been linked with the problem of some recipient areas receiving excessive funding and other partner areas receiving not enough (Ni, Zhang, and Yu 2009).

In addition, while the competitive nature of this mechanism has been cited as improving reconstruction efforts, the absence of a maximum limit for giving has been seen to have encouraged an unhealthy level of competition for political gain, which resulted in an inefficient allocation of funds. Moreover, preliminary findings by Bulte, Xu, and Zhang (2013) indicate that aid may have even had a Dutch-disease effect on the recipient counties and that aid was associated with a contraction of these counties' manufacturing sectors. Given the novelty of this mechanism, some scholars point out that additional research on detailed regulations for the mechanisms' implementation and supervision is needed (Wang 2008).

With these considerations in mind, five challenges lie ahead for the pair-wise province-to-county aid model:

1. This model should not be universalized. A big step has already been taken from pair-wise disaster relief and recovery to pair-wise aid for development, as in the case of the Three Gorges Dam in 1992. However, these instances of partner assistance are almost always between well-off places and either impoverished areas that are experiencing unique social conditions—for instance, big disasters—or severely poverty-stricken areas. In other words, the peculiarities and limitations of this model should be clearly recognized, and the model should not be adopted in inappropriate contexts.
2. This model stems from poverty-relief activities between particular partners and is backed by certain traditional elements but is not otherwise legally guaranteed. Other challenges exist in more effectively managing the model. For example, the central government often has a coordinating body to implement the partner assistance program, but uniform training and promotion of effective communication, especially the exchange of experiences, remain challenging. After the Wenchuan earthquake rescue and relief efforts concluded, various local governments held only summary and commendation conferences, and the central government didn't do anything other than hold a brief press conference. This is, admittedly, an institutional flaw.
3. Providing comprehensive and appropriate assistance and ensuring project quality are difficult in the case of large-scale, long-distance partner assistance. A pair-wise aid relationship requires cooperation and mutual respect. Partner assistance is always conducted under the condition that the recipients fully respect the assistance providers. In the same way, assistance providers need to take into account recipients' perspectives and circumstances, especially unique cultural practices. They might also address ways to integrate recipients' cultural practices and participation into a detail-oriented approach to the construction of infrastructure facilities.
4. Partner assistance is predominantly construction oriented and often marginalizes administrative development. For example, while there is nothing wrong with the infrastructure component, it also involves certain development and management issues such as operating infrastructure after its construction is completed. Operating sophisticated

infrastructure projects after the restoration and reconstruction phase has become a challenge in many places.

5. Participation of civil society organizations is insufficient. Because the assistance efforts are mostly infrastructure oriented, nongovernmental organizations don't have much of a chance to participate. However, in the long run, only nongovernmental organizations can establish multiple levels of contact, thus lending permanence to partner assistance activities. China's NGOs are still underdeveloped (Wang 2013), and that's why the issue has not yet made it into the agenda of the partner assistance program. But with the further opening up of the society, the issue of the participation of nongovernmental organizations will only become more significant.

Despite many challenges, the pair-wise province-to-county aid model established a precedent for leveraging institutional forces in conducting relief and recovery operations, which is nothing short of a historic breakthrough for China. Besides, such an institutional model can emerge only from those who have abundant administrative experience and are capable of looking at problems from an institutional and structural perspective. The fact that such a model emerged in China demonstrates that China's public administration is undergoing a significant shift. The notions of China's administrative elite and cultural elite are undergoing a relatively systematic transformation. This kind of cultural consciousness in approaching and handling problems from an institutional perspective, if further developed, will give a significant impetus to China's social reforms.