

Effective Recovery after a Catastrophic Earthquake: Community, Financial and Environmental Collaboration

The case of Kobe City

Japan Project Brief

Background and Objectives

On the morning of January 17, 1995, the people of Kobe and surrounding areas were awoken by large tremors. The tremors were the result of a magnitude 7.3 earthquake, the so-called Great Hanshin Awaji Earthquake. The earthquake was a prominent example of an urban disaster, with subsequent such disasters including Hurricane Katrina in New Orleans in 2005, Bangkok flooding in 2011, and Hurricane Sandy in New York in 2012. The Great Hanshin-Awaji Earthquake was the first catastrophic disaster to hit a modern urban city in Japan. Casualties were reported at 6,402 people, and economic loss and damage was estimated at about JPY10 trillion¹, which accounted for 1.87% of the Japanese GDP of that year. About 100,000 houses were completely destroyed and 316,000 people had to evacuate. The earthquake also damaged the interconnected urban infrastructure. As a result, the earthquake generated a tremendous amount of waste (20 million tons), which is equivalent to 7-8 years of waste in Hyogo Prefecture. There was so much waste, in fact, that it was collected and piled in parks in central Kobe City (Photo 1). The recovery of basic lifelines, such as electricity and gas, took a few weeks and the complete reconstruction of infrastructure, such as train systems, ports, and highways took about three years. Housing reconstruction took five years, including constructing public housing and meeting the needs of people who had to stay in temporary housing. Finally, it took 10 years for the population of Kobe City to return to pre-earthquake levels. Kobe City made this recovery with what might be called miraculous speed, and simultaneously improved citizens' quality of life, environment and resiliency of the city. This efficient restoration was achieved by involving various stakeholders, filling gaps between local financial needs and regulations, and treating waste effectively.



Photo 1: Accumulated disaster waste in a park in the central area of Kobe

Source: <http://www.jiji.com/jc/v4?id=saigai-haikibutsu&p=950202>

Kobe City's Effective Recovery after a Catastrophic Earthquake: Community, Financial, and Environmental Collaboration

Project Overview

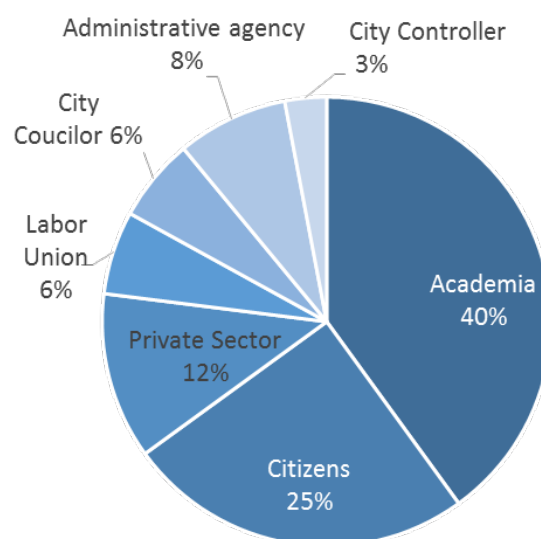
Immediately after the disaster, the mayor of Kobe City shared his vision, which aimed at not only physical recovery to the original state, but also an advanced disaster prevention model city, which could withstand natural disasters and where citizens could live safely. His vision was materialized as a plan which was implemented effectively with recovery response measures based on the following factors.

Development of the Kobe City Restoration Plan

Even though there was no legal obligation, local governments in Japan conventionally developed a recovery plan after a large-scale disaster in order to indicate a clear pathway for recovery to citizens, to reconstruct the city more resilient way and to use it as a basis for acquiring financial support from national government. In the case of Kobe City, the Kobe City Restoration Plan was formulated within 5 months after the earthquake to meet the deadline of national budget appropriations. In order to facilitate the planning process, a two-stage approach was adopted; the first stage was to formulate guidelines (published on March 27, 1995), which stipulate fundamental principles, target years and a vision for restoration; and then the second stage was to formulate a restoration plan itself by fleshing out the guidelines into a more specific plan (published on June 30, 1995). This two-stage approach also solved a typical dilemma on how to develop a master plan smoothly by involving local residents, who were evacuated from affected areas and did not have much time for this especially immediately after the earthquake. Although a detailed plan was developed in the second phase, the plans in each sector such as for housing and ports were implemented before the comprehensive city restoration plan was developed, and those plans were merged to the comprehensive plan later.

Multi-stakeholder Involvement

The planning and implementation of the Kobe City Restoration Plan were carried out using a multi-stakeholder approach. The limited number of experts from local government and academia participated in the guidelines development phase, while one hundred people were members of the Kobe Council for Restoration Planning that was composed of various stakeholders from academia, local residents, the private sector, labor unions, and relevant administrative agencies (Figure 1). Half of the committee members were non-policymakers, i.e., local residents, labor unions, and representatives from the private sector.



The total number of the members is 100

Figure 1: Kobe City's Committee for Reconstruction Planning

Source: Produced by author based on Overview and Restoration of Great Hanshin-Awaji Earthquake (in Japanese). Kobe City. January 2011. <http://www.city.kobe.lg.jp/safety/hanshinawaji/revival/promote/img/honbun.pdf>

Especially at the second stage of restoration plan formulation, "Machizukuri (community planning) Organization" under the Ordinance Concerning the City of Kobe Regional Planning and Community Development Agreements (1981) played a key role in promoting the resident-oriented community development. Kobe City had its own such system for

promoting community development based on the citizens' initiative under this ordinance even before the disaster. The Machizukuri Organization facilitated a consensus building among citizens and liaised between local government and residents. The Kobe City government also facilitated the planning process by dispatching experts to meetings and forums for the reconstruction plan, creating local offices, and sending newsletters. Involvement of the community from the planning phase resulted in smooth implementation of restoration plan.

Reconstruction Fund

Since the damage was tremendous, the financial shortage for restoration measures was apparent. To solve this challenge, the Great Hanshin-Awaji Earthquake Reconstruction Fund was established in April

1995 with JPY900 billion in funds. Until 2007, the fund financed approximately JPY360 billion for recovery and reconstruction projects in housing, industry, and education. The goal of the fund was to complement public financing schemes for recovery and reconstruction at the municipality level. Hence, it aimed to meet diverse needs in disaster-affected areas in a timely and flexible manner that could not be met by existing public financing schemes.

The governments of Hyogo Prefecture and Kobe City borrowed JPY880 billion from financial institutions and provided interest-free financing to the fund. In addition, the national government provided an ordinary local grant tax to the local governments to pay for part of their interests. As a result, the reconstruction fund had financed operations sufficiently to meet recovery and reconstruction needs (Figure 2).

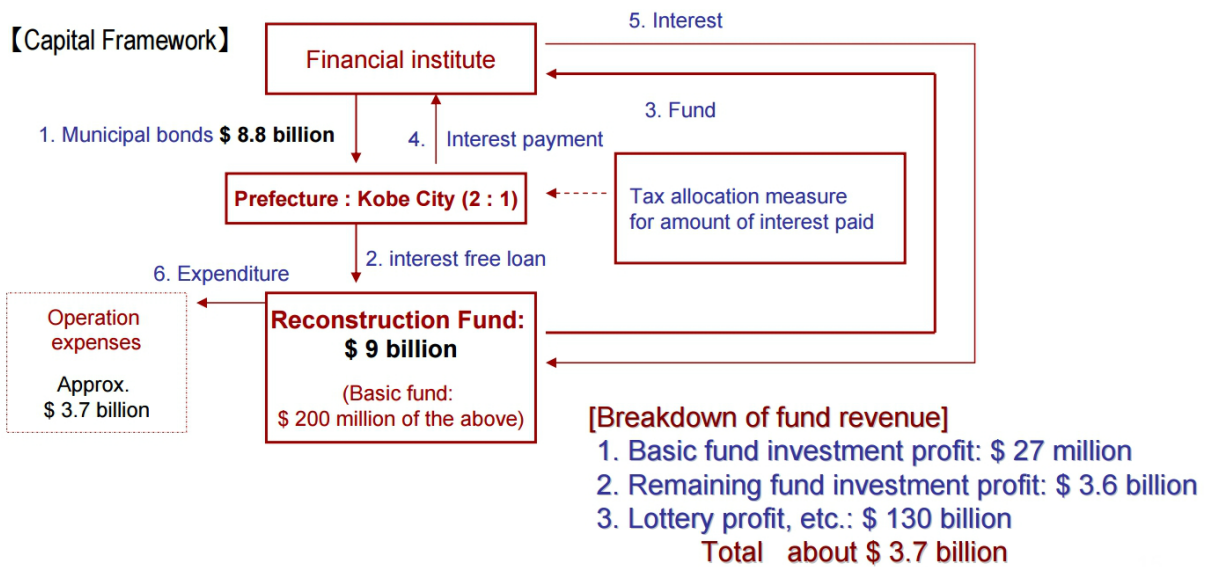


Figure 2: Mechanism of the Great Hanshin-Awaji Earthquake Reconstruction Fund (established in April 1995)

Source: Adachi, K. 11 December, 2008. Our Initiatives for Recovery from the Great Hanshin-Awaji Earthquake. http://www.recoveryplatform.org/assets/publication/1.3_hyogo.pdf

Disaster Waste Treatment

Since Kobe City had a high density, the volume of disaster waste from the earthquake was too large to temporarily store, transport, and treat. Waste from damaged houses and buildings owned by individuals and small-medium companies were treated and financed by municipalities as an exception. To provide

financial assistance to municipalities, the national government paid half of the dismantling and treatment expenses, permitted municipalities to issue disaster countermeasure bonds for waste treatment, and disbursed 95% of the principal and interest redemption amounts. Kobe City partnered with other municipalities both from within and outside the affected area in order to accelerate

Kobe City's Effective Recovery after a Catastrophic Earthquake: Community, Financial, and Environmental Collaboration

the process of waste treatment. They managed to secure sites for temporary storage, crushing, and incineration treatments. Port Island in Kobe port played an especially important role, as the port was in the process of land formation and was severely damaged by the earthquake at the time; therefore concrete was in high demand as construction material. Marine transport also contributed to the smooth transportation of waste from urban areas, where the land transportation system had been severely damaged.

Project Impacts

Economic Impact:

The Great Hanshin-Awaji Earthquake Reconstruction Fund financed 116 projects in the fields of life support measures, housing measures, industrial measures, and education, among others (Figure 3). The fund played an important role in economic recovery. Specifically, housing and industrial measures cannot be financially supported by the existing public financial schemes because the Japanese laws restrict public financial support that would contribute to individual assets; only

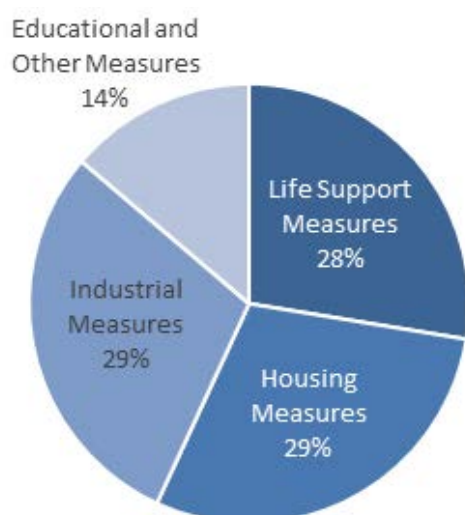


Figure 3: Compositions of projects supported by the Great Hanshin-Awaji Earthquake Reconstruction Fund

Source: Great Hanshin-Awaji Earthquake Reconstruction Fund Home Page. Overview of the fund (in Japanese)
<http://www.sinsaikikin.jp/kikin/index.htm>

physical goods could be distributed by governments. However, considering the contributions of households and the private sector in the economy, the effect of funds supporting reconstruction in these sectors was tremendous.

Social Impact:

The Kobe City government and citizens joined together to tackle and overcome various difficulties. A trusting relationship was built and strengthened not only between the local government and citizens, but also in the community through the restoration process. Consequently, local communities were also revitalized. They all recognized the importance of both social capital in the restoration process and also the mind-set of an “independence and cooperation” approach in the disaster management at local level, i.e., your own safety should be protected by yourself and community’s safety should be done by the community.

Environmental Impact:

Waste treatment was completed within two years after the earthquake. The recycle rate was 50.1%, which achieved its initial target of 50.0%. About 90% of recycled items were treated for land formation. Particularly, incombustible waste, such as concrete, accounted for 85% of the total waste, 50% of which was utilized as landfill for new projects in Kobe port.

Lessons Learned

Benefits of Multi-stakeholder Involvement and Social Capital Formation to Accelerate Reconstruction:

The experience of forming a master plan after the earthquake shows the importance of involving diverse stakeholders. Some

communities spent eight months proposing their community development plan while others spent 22 months. Communities that needed more time to propose their plans suffered from large damage and built multiple consortiums, which required more time to coordinate. Hence, it is critical to promote community development and social capital in normal times so that dialogue can be facilitated among residents, companies, and local governments, particularly in areas of high disaster risk and high population density. By doing so, after a catastrophe, consensus building and community cooperation will be faster and more effective.

Reconstruction Fund to Complement Other Public Financial Schemes:

Reconstruction fund was found to be effective to fulfill the local governments' financial gap for recovery and reconstruction, especially for those areas where national governments cannot provide financial support due to legal limitation. This fund could be used as a supplemental financial source to the budget from national government and provided flexible financial support for long-term². The effectiveness of this kind of fund was confirmed not only in Kobe, but also in the case of Chi-Chi Taiwan Earthquake in 1999, when the Taiwanese government established a relief fund for housing and life recovery to complement the government's budget.

Measures for Effective Disaster Waste Treatment:

Compared to other disasters, the Kobe City government succeeded in treating disaster waste relatively quickly and effectively, as they could find co-benefits among stakeholders such as urban residents and port developers. The perspective of examining both sides in demand and supply is also critical for promoting recycling rates of disaster waste. The recycling rate of concrete was high because of the high demand for use in landfills. In contrast, the recycling rate of wood waste was low because of low demand. Hence, to increase the recycling rate of disaster waste, it is important to secure temporary storage sites for low-demand waste.

¹ Cabinet Office Japan. Disaster Management in Japan. Chapter 1. Overview and damage of the Great Hanshin- Awaji Earthquake (in Japanese)

<http://www.bousai.go.jp/kyoiku/kyokun/pdf/101.pdf>

² All projects under this fund are planned to be completed by 2020. Source: The news article on 15 March, 2017 of Kobe Shinbun.

<https://www.kobepn.co.jp/news/shakai/201703/0010000275.shtml>

The Tokyo Development Learning Center (TDLC) program is a partnership of Japan and the World Bank. TDLC supports and facilitates strategic WBG and client country collaboration with select Japanese cities, agencies and partners for joint research, knowledge exchange, capacity building and other activities that develop opportunities to link Japanese and global expertise with specific project-level engagements in developing countries to maximize development impact.

Contact:

World Bank Group
Social, Urban, Rural and Resilience Global Practice
Tokyo Development Learning Center (TDLC) Program
Fukoku Seimei Bldg. 10F,
2-2-2 Uchisaiwai-cho, Chiyoda-ku,
Tokyo **100-0011** Japan
Phone: +81 (3) 3597-1333
Fax: +81 (3) 3597-1311
Web: <http://www.jointokyo.org>