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A Study on Sustainability of Earthquake-Damaged Cities by Examining the Case of Kobe City in Japan

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Abstract

The global trend shows that as the population gets concentrated in cities and the urban space gets more expanded, the more damages from natural disasters increase in numbers and their sizes. Therefore, systematic disaster management and comprehensive urban regeneration measures are required to minimize the damages and to promote sustainable development of cities.

But so far, studies on disaster recovery and urban reconstruction focused on physical and scientific methods. The aim of this study is to explore ways to create a safe community and urban foundations from a sociocultural point of view, aimed at sustainable urban regeneration after disasters going beyond simple disaster recovery and urban reconstruction.

This study focuses on the case of Kobe in Japan, which overcame disasters after the 1995 Hanshin-Awaji earthquake and accomplished urban development through the use of differentiated resources in the region and discusses how disaster resilience and sustainable development can be realized in earthquake-damaged cities.

Keywords: Sustainability, Disaster Risk Reduction, Resilience, Urban Regeneration, Community, Creative Design City, Kobe

Introduction

From 1980 to 2016, six cases of the top 10 natural disasters worldwide were caused by earthquakes. The Great East Japan Earthquake and tsunami on March 11, 2011, were the worst disaster with an economic loss of about $ 211 billion, and the 1995 Hanshin-Awaji(Kobe) earthquake was the third most damaging disaster with an economic loss of $ 11 billion.

The intensity and frequency of earthquakes have increased not only in Japan but around the world. Even if natural disasters such as earthquakes cannot be prevented, measures to minimize damage are urgently needed, and sustainability is asked for the possible disaster-stricken cities in the future.

This paper is aimed at exploring sustainable development of earthquake-damaged cities from a sociocultural perspective by examining the case of Kobe City in Japan which overcomes the 1995 earthquake and continues development by disaster resilience and creative city policies.

Overview of Kobe City and Hanshin-Awaji Earthquake

Kobe is the sixth-largest city in Japan and the capital city of Hyogo Prefecture. It is located on the southern side of the main island of Honshu, on the north shore of Osaka Bay and about 30km west of Osaka. Kobe was one of the cities to open for trade with the West following the 1853 end of the policy of seclusion and has been known as one of the largest ports in Japan and one of the best ports in Asia.

The Hanshin-Awaji(Kobe) Earthquake occurred at 5:46 a.m. on January 17 in 1995. The epicenter of the earthquake was the northern part of Awaji Island (N34.36 E135.02) and the 16 kilometers below the earth's surface. The force of earthquake registered 7.3 on the Richter scale, 6 and 7 on the Japanese scale in different areas. The earthquake hit the existing urban area of Kobe extending to more than 20 km. About 4,600 people were killed, 212,443 were homeless, and many parts of the city and port facilities were destroyed. While fires occurred simultaneously in various places, water-supply facilities for firefighting were damaged by the earthquake, and firefighting activities could not be carried out fully.

The Hanshin-Awaji Earthquake was the first urban epicentral earthquake that Japan experienced in the modern era. It has become clear that there are typical problems that can occur in case of a disaster in modern cities.

Build Resilience - Disaster Resistant Cities

The Sendai Framework for Disaster Risk Reduction(SFDRR) 2015-2030 was adopted by UN Member States on 18 March 2015. It is the first major agreement of the 2030 development agenda, and aims for "the substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries." [1]

There is *The Four Priorities for Action:* This is explained in terms of features that respond to disasters in Japan and Kobe.

A. Understanding disaster risk: Japanese Disaster Culture

As frequent natural disasters occur in many parts of Japan, local residents share and expand measures to cope with and overcome disasters. Knowledge, wisdom and technical methods to cope with these disasters are called *'Disaster Culture'*. People learn how to overcome disasters and reduce risks through memories and records of past natural disasters, learning and response training in everyday life. And they explore how to reduce risks by preparing for and responding to disasters by leaving them as lessons for the next generation. And they keep it a lesson for the next generation to explore how

to prepare and respond to disasters. Local residents understand their local history and climate and think about how disaster management can be integrated into their daily lives. It also conceptualizes disaster management based on the Japanese perception of nature, disaster, life and death.

B. Strengthening disaster risk governance to manage disaster risk: Self-help, Mutual-help, and Public-help

In Japan, there is a motto "Self-help, Mutual-help, and Public-help" on disaster prevention and safety. 'Self-help' means that citizens individually play a role to protect by themselves. 'Mutual-help' is the role of the residents' organization and means mutual cooperation among communities such as town associations and businesses. 'Public-help' refers to the role of the government and the local government in handling for disaster at the administrative level. The basic guideline is to protect residents themselves and their family and the region based on the self-reliant disaster prevention activities.

Following the earthquake, citizens recognized the importance of human-to-human ties, and this was recognized again during the recovery process. [2]. The Kobe earthquake asked Japanese society "what is community", and community regeneration became an important task for disaster recovery and revival.

C. Investing in disaster risk reduction for resilience: The Great Hanshin-Awaji Earthquake Reconstruction Fund

The Great Hanshin-Awaji Earthquake Reconstruction Fund was established in 1995 with the aim of implementing projects on a stable and flexible basis, and to promptly meet the multifaceted needs of disaster victims. A 900-billion-yen fund was raised to support the recovery of disaster-affected areas and by 2007, approximately 360 billion yen was spent on projects to assist in rebuilding communities through housing construction, support to industry, and rehabilitating schools. [3]. In this way, Earthquake Reconstruction Fund increased the welfare for the victims and reduced poverty, and provided opportunities to survive in times of need, through insurance, and led to a quicker restoration process.

D. Enhancing disaster preparedness to "Build Back Better" in recovery, rehabilitation and reconstruction: Creative Reconstruction

The recovery, rehabilitation and reconstruction phase is a critical opportunity to build back better, including through the integrating of disaster risk reduction into development measures.

The Kobe city pursued a course of *creative reconstruction*. It sought to use the earthquake as an opportunity not just to rebuild, but to redress long-term challenges, capitalize on emergent opportunities, and build back better. Creative reconstruction also led, from 2000 onwards to the building of a life sciences cluster in Kobe [4].

A creative and resilience city saves people's lives, enhances social and economic development, and provides equitable, prosperous and sustainable urban development. Therefor mayors and local government leaders have to prioritize resilience as part of their political and sustainable development agenda for their communities [5].

Table 1
Sustainable Development Process of Earthquake Damaged Cities

Period	Goal	Policy	Case(**Kobe**)
Pre-Disaster (Before 1995)	Local communities	Community Development	Machizukuri(community building process), **the Mano District**
Post-Disaster (After 1995)	the short-term (crisis / recovery)		
	Resilient Cities	Community Rebuilding, Reconstruction	Disaster-Safe Welfare Communities, **BOKOMI**
	the long-term (opportunity / new development)		
	Sustainable Cities	Urban Regeneration	A Creative City, **City of Design Kobe**

Urban Regeneration Model for Sustainable Development - Creative Design City

Only two years after the earthquake, Kobe rebuilt all of its public facilities, including ports, roads and railways, and renovated houses ahead of its original plan. However, the process has led to the elimination of city culture and the depletion of Kobe's finances in line with the overall economic slump in Japan. Since then, Kobe has pushed for urban development projects that involve citizens of Kobe as well as city hall and city councils. There are three basic guidelines in Kobe City's development projects.

A. The Urban Design

The first is *the Urban Design* that fully captures the natural charm of Kobe, such as Mt. Rokko and the sea. The tourism facilities that make use of the natural environment of the mountains and the sea are the attractions of Kobe. Mt. Rokko has many places to enjoy hiking courses and nature scenery, and Arima Onsen behind the mountain is a hot spring resort complex that is popular among foreign tourists.

B. The Life Design

The second is *the Life Design* that allows citizens to enjoy leisure time by expanding the waterfront space facing the sea and creating a green area. In addition, the level of leisure life was enhanced by combining culture, art and education.

The characteristics of these urban designs come from the history of Kobe City. In 1868, Kobe opened a port to become Japan's gateway and actively accepted western arts, and various cultures became established. The old foreign embassies and residential areas under Mt. Rokko are renovated to art gallery and museums, attracting tourists to exotic landscapes.

The Café Street that foreigners were looking for became a shopping and cultural town with a mix of modern cafes and shopping centers, and the area where the Chinese lived was set up as Chinatown, creating a unique attraction in harmony with nearby traditional Japanese street shops.

C. The Creative Design

The third is *the Creative Design* that secures new driving force in the city by strengthening creative talent cultivation and knowledge industry development function. It is building a medical cluster that fosters the healthcare industry without remaining in the existing harbor functions and is taking advantage of new industries to enhance its competitiveness.

Fort Island, located at the southernmost tip of Kobe City, illustrates this characteristic of Kobe. It transformed into a complex urban space with housing, parks, international convention centers, exhibition halls, fashion towns, and large-scale water facilities as well as harbor facilities. Kobe Harborland, which redeveloped the cargo train station in the southern port, attracts tens of thousands of tourists every day with shopping, dining and entertainment. Around 20 to 30 minutes centering on the Kobe city branch, various industrial complexes have been established to take charge of the economic functions of the city. The Kobe Distribution Center, built near Hanshin Expressway, has become a representative distribution business complex in Japan with various warehousing and transportation functions. The Kobe Hi-Tech Park in the west area is becoming a model for the urban development of work-residential proximity.

In this way, Kobe city has a residential, industrial and cultural blend of cities. After the earthquake in 1995, the large-scale urban regeneration project made Kobe City more attractive.

Conclusions

For cities to be sustainable, it is necessary to create a safe city that is resistant to disasters by reducing disaster risk and building resilience. Next, a new urban development strategy should be used to drive social and economic development and promote the sustainability of cities so that people can dream of the future within the city.

Searching for local resources for a resilient and sustainable city becomes essential in understanding how the city is able to cope with the natural disaster, restoring existing structures and functions and creating new ones. In such a process, culture and creativity have increased of importance in urban regeneration. The local culture is considered an asset to protect and preserve of city's identity and to foster city development and social integration.

Starting from the earthquake, a new urban strategy of the Kobe city was promoted in order to improve attractiveness and vitalization of the city through the creative sector, particularly in design activities. Such strategy highlights the importance of the community for the local development: the idea to use creativity to promote the city aimed at both revitalizing the economy and creating a comfortable place for living [6].

In Kobe, there was a local community Machizukuri that was the foundation of the city, volunteer disaster-reduction organizations called Disaster-Safe Welfare Communities (BOKOMI) and a creative urban design strategy centered on culture.

Under the motto of self-help, mutual help, and public assistance, it is necessary to share roles appropriately and cooperate among citizens, communities, and the local government for the creation of a safe and sustainable development city.

It is considered that a safe city will be achieved under such mutual cooperation. But the most important point, is people. The Kobe citizens helped local industries and communities overcome the effects of the damage caused by the earthquake. The government measures only supported their efforts from behind. Good human relationships are the key to success when trying to implement policy and receiving cooperation from the national and prefectural governments. Once good relationships are established, the local industry's conditions and issues and its needs and possible solutions can be considered properly. [7].

In Japan, despite all the havoc brought by natural disaster, people have continued crisis management response and disaster drill and also taking lessons from the disaster experience in the process of overcoming it. Courtesy of such effort, when the earthquake with a magnitude of 6.3 near the island of Awaji in Hyogo, Japan occurred on April 13, 2013, after about 18 years of Kobe earthquake, no fatalities were reported and the number of injuries was limited to about 20.

The case of Kobe City Regeneration, which took a new leap even though the aftermath of the disaster, sends a message that sustainable development is possible in earthquake-damaged cities around the world.

References

[1] UNISDR, How To Make Cities More Resilient A Handbook For Local Government Leaders, Geneva, 2017 version, p. 15.

[2] CITY OF KOBE, Comprehensive Strategy for Recovery from the Great Hanshin-Awaji Earthquake, March 2010, p. 110.

[3] UNISDR, How To Make Cities More Resilient A Handbook For Local Government Leaders, Geneva, 2017 version, pp. 44-45.

[4] The Tokyo Development Learning Center(TDLC), Kobe Creative Reconstruction, March 2018, p. 6.

[5] UNISDR, How To Make Cities More Resilient A Handbook For Local Government Leaders, Geneva, 2017 version, p. 20.

[6] Stefania Oliva, Luciana Lazzeretti, *Adaptation, Adaptability and Resilience: The Recovery of KOBE after the Great Hanshin Earthquake of 1995*, European Planning Studies, January 2017, p. 12.

[7] CITY OF KOBE, Comprehensive Strategy for Recovery from the Great Hanshin-Awaji Earthquake, March 2010, pp. 211, 281.

[8] Rajib Shaw, Katsuihciro Goda, *From Disaster to Sustainable Civil Society: The Kobe Experience*, Disasters, 2004, 28(1), pp. 16-40.

[9] Tohru FUKUSHIMA, Akira TACHIBANA, *Comparative Study on the current status and characteristics of Creative Cities in japan, from the viewpoints of Urban Policy and Creative Index*, University of Hyogo, School of Human Science and Environment, Research reports No. 16, 2014, pp. 39-54.

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