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The Differing Effectiveness of Social Capital in Building Disaster Resilience between China and Japan

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Abstract

Large-scale disasters have occurred frequently in the 21st century, including the Great East Japan Earthquake (2011), the Kumamoto Earthquake (2016), major earthquakes in Sichuan, China (2008 and 2013), and the Canterbury Earthquake in New Zealand (2011). As such, reducing disaster risk and increasing resilience have become common challenges for all humankind. The concept of social capital gained the attention of disaster researchers and policymakers during the 1990s. This concept encompasses elements such as trust, cooperation, and networks. It includes three types of social capital: bonding (strong ties and trust within a community), bridging (ties between different communities, non-profit organizations, and others), and linking social capital (connections between communities and public institutions, such as governments). The extant literature typically finds that social capital, as a resource, can effectively increase the speed of community recovery and enhance community resilience in the face of disasters, such as by helping disaster victims receive assistance more quickly, disseminating information more effectively, and promoting cooperation. While an emerging consensus supports social capital's important role in building disaster resilience, its role is not fixed and its effectiveness may vary across social settings. That is, social capital does not function in isolation; its role depends on the context in which it is embedded (Dasgupta 2003). From a country perspective, the amount, type, and role of social capital varies across different political and social structures. Thus, social capital is also closely related to the environment in which it is embedded and characterized as "inherently contextual" (Bernier et al. 2014; Yila et al. 2013; Cai 2016). After reviewing the literature on definitions and types of disaster resilience and social capital, this study considers post-disaster reconstruction cases in Japan and China to analyze the differences in the effectiveness of social capital for building disaster resilience under different political and social contexts. Specifically, the following section reviews the literature on the definitions and types of resilience and social capital, and

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role of social capital in building resilience.

We then examine the "inherently contextual" nature of social capital. Section 3 compares the cases of the 2011 Great East Japan Earthquake and 2008 Sichuan Earthquake in China to examine the differences in the effectiveness of social capital in disaster response between Japan and China. Finally, we analyze the impact of the differences in social systems between China and Japan on the differences in the effectiveness of social capital, and provide recommendations for disaster managers.

Key words: social capital; disaster resilience; 2008 Sichuan Earthquake; the Great East Japan Earthquake

1. Introduction

Large-scale disasters have been occurring frequently since the beginning of the twenty-first century, including the Great East Japan Earthquake (2011), the Kumamoto Earthquake (2016), and major earthquakes in Sichuan, China (2008 and 2013). Today, when disasters occur so frequently, mitigating disaster risks and improving the capacity to respond to disasters is a challenge that must be addressed by everyone.

The concept of social capital attracted attention from 1990 to 2000 among disaster researchers and policy drafters. Social capital is a concept that encompasses several elements, including trust, cooperation, and networks. It is of three types: bonding (strong ties and trust relationships within a community), bridging (connections between different communities or with NPOs), and linking social capital (cooperation between a community and the government or other public institution). Many studies have noted that social capital is a useful resource that allows those affected by disasters to quickly receive support, effectively transmit information, and promote cooperation. These elements help communities recover more quickly from disasters and improve their ability to respond to disasters.

A consensus is gradually being reached that social capital plays a key role in disaster response, but that its role is not fixed and is more effective in some social environments than in others. Social capital does not function independently; its operation differs according to the background in which it is embedded (Dasgupta 2003). The quantity, type, and role of social capital also vary across countries with different sociopolitical structures. To summarize, social capital is closely related to the environment that it is embedded in and has the characteristic of being "inherently contextual" (Bernier et al. 2014; Cai 2016; Yila et al. 2013).

This paper reviews definitions related to social capital and literature concerning social capital and disaster response, and then analyzes the differences in the effectiveness of social capital against different sociopolitical backgrounds, using the cases of recovery after earthquakes in Japan and China as examples. Specifically, the next section reviews the definitions and types of social capital and literature relating to the role of social capital in disaster response and examines the inherent contextuality of social capital. Section 3 compares the cases of the 2011 Great East Japan Earthquake and the 2008 Sichuan Earthquake, China, and examines the differing effectiveness of social capital in disaster response between China and Japan. Finally, the paper analyzes the effects of the different social structures between Japan and China on the differing effectiveness of social capital between the countries and gives advice to disaster administrators.

2. The role of social capital in building disaster resilience

2.1. The definitions and types of social capital

The concept of social capital is an ongoing subject of debate. Putnam (1993) indicated that the

three aspects of "trust," "reciprocity norms," and "networks" are the elements that comprise social capital. In concrete terms, trust refers to an individual's prediction of how the people around them in the same society will behave in the future. Furthermore, norms are informal regulations that form rules for transactions and daily life, and networks are connections between individuals. Putnam (2000) further defined social capital as "features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit ." This definition came to be frequently cited in debates about social capital. Szreter and Woolcock (2004) defined information and resources as the wires of social capital, based on Putnam's research, and defined connections between people, that is, networks, as the center of social capital. Aldrich (2012) considers social capital a resource that complements the norms and information disseminated through social networks. Despite controversies over the definition of social capital, the consensus acknowledges networks, trust, and reciprocity as fundamental elements of social capital. Definitions of social capital continue to be examined, but academia has reached consensus on two points: first, that we should regard social capital as a resource and treat it in the same way as physical capital; second, that the elements of trust, relationships, networks, and norms are major component elements of social capital.

Many studies have examined classifications of social capital, ultimately classifying it into bonding, bridging, and linking (Aldrich 2012; Putnam 2000). Bonding refers to relationships with "people who are together" or "people who are similar," such as family, close friends, and neighbors, and it arises between people with firm, intimate relationships. Bonding social capital can be considered a network of members who know each other well, interact frequently, and have a high relationship density (Claridge 2018). Bridging social capital represents connections that link people together beyond social elements (race, class, religion, etc.), which are observed when society breaks down (Aldrich et al. 2015). In other words, it is an "intermediary" that bridges communities, groups, and organizations. Bridging refers to the social relationship of exchanges between people. The linking type of social capital has also attracted researcher attention. Links are the trust networks between people who interact beyond the explicit, formal, systematic gradients of power and influence in society (Szreter & Woolcock 2004). The bonding and bridging types consider relationships between people who are mainly in similar positions, while the linking type focuses on vertical relationships (Aldrich 2012). Linking social capital also includes social relationships with people in authority, not just the government, and can be used to access physical resources and power (Stone 2001).

2.2. The role of social capital in building disaster resilience

Disaster resilience is a complex concept that includes preparation before a disaster, rapid response after a disaster, and recovery and restoration after a disaster. This process requires a wide range of measures, including formulating plans in the event of an emergency, establishing evacuation centers, preparing relief provisions, transmitting evacuation information, conducting restoration projects, providing psychological care for the community, and reviving economic activity (Hayashi 1995).

The main roles that social capital plays in disaster resilience are set out below. When preparing for

disasters, many researchers have pointed out that social capital, particularly its networks, is an important channel for transmitting warning information (Wu et al. 2010). For disaster resilience, social capital makes preparing for emergency situations more efficient and allows information and knowledge to be transmitted (Shi et al. 2016). During disaster recovery, social capital can play the role of insurance, provide information to people affected by the disaster within the networks, and give economic and material support (Aldrich 2012). Through fact-finding surveys of communities that were reconstructed following the Great Kobe Earthquake and the Great East Japan Earthquake, Otani (2013) found that the level of social capital was a more important indicator for evaluating the level of reconstruction in disaster-affected areas than the types of residences or the environment.

Social capital has many positive aspects, but it does not necessarily have only positive effects and may also have positive effects (Harada 2013). According to Aldrich (2012), disaster-affected people with strong social capital can access necessary information and support and can recover more quickly. Conversely, areas and communities without sufficient social capital may not be able to maintain the speed of reconstruction that is possible in areas with broad networks. People who were marginalized in society before the disaster could be excluded from the reconstruction process. In addition, strong social capital may have negative effects, such as resistance to timely evacuation (Buckland & Rahman 1999), resistance to state programs and aid policies, and reduced relief and reconstruction speed after the disaster in conjunction with this (Aldrich & Crook 2008). Moreover, the unequal distribution of social capital can create synergy that operates on existing social and economic inequalities and cause negative effects. Wealthy communities with high academic qualifications tend to be well organized and have stronger political ties (Williamson 2013), but existing social inequalities, especially discrimination against minorities and women, may be reinforced by the mobilization of social capital (Ganapati 2013).

This unequal distribution of social capital raises the following question: does social capital function independently? Social capital cannot be considered a fixed concept, and its role differs depending on the background in which it is placed (Cai 2016; Dasgupta 2003; Putnam 2000; Szreter & Woolcock 2004; Yila et al. 2013). Reinforcing the state's comprehensive governing ability and enriching its systems will lead to greater trust from its citizens and contribute to a more stable civil society, which is thought to be useful for manifesting both vertically (linking social capital) and horizontally (bonding social capital). Conversely, if the state's governing ability is too strong, citizens' autonomy may be reduced; this would incite a "separation" of social capital, where horizontal social capital is not organized and vertical social capital is controlled by the government, not the citizens, and communication is not smooth. This characteristic of social capital is described as being "inherently contextual" (Bernier & Meinzen-Dick 2014; Cai 2016).

In summary, the way in which social capital is tied to its functions is itself influenced by the already existing social structures. When examining disaster resilience and the functions of social capital, different political, social, and cultural contexts are strongly influenced by social capital and must be considered.

3. Case studies related to the 2008 Sichuan Earthquake and the Great East Japan Earthquake

As discussed above, social capital is inherently contextual; social capital may have different quantities, types, and roles in different social situations. Accordingly, the differing effectiveness of social capital will influence disaster resilience.

In that case, how does the effectiveness of social capital differ in different social system contexts? Moreover, how are these differences related to the social system contexts in which the social capital is embedded? Analyzing this topic has significance in developing different disaster resilience strategies for each social background.

This study examines the 2011 Great East Japan Earthquake and the 2008 Sichuan Earthquake as comparative case studies. China and Japan are both countries frequently affected by earthquakes, and the Great East Japan Earthquake and the Sichuan Earthquake were large-scale disasters with large destructive power that significantly affected China and Japan. These two countries have different backgrounds in terms of their social systems, and each country's social systems have unique characteristics regarding the role of social capital after the disaster and resilience building. This paper selects these two examples as its research subject and analyzes the differences in the role of social capital in disaster resilience in both countries; it then discusses the differences in the influence of different social systems on the effectiveness of social capital.

The relevant data were investigated with secondary analysis methods. Specifically, they include official reports (by local governments, the state, and international organizations) on the disasters, relevant studies on disasters, particularly studies on the role of social capital in disaster resilience, and data from surveys published by research institutes.

3.1. The 2008 Sichuan Earthquake

The 2008 Sichuan Earthquake caused enormous damage. As of September 18, 2008, there were 69,227 dead, 374,643 injured, 17,923 missing, and RMB 845.1 billion in direct economic loss, making it the most destructive earthquake since China's founding and the most deadly since the Tangshan Earthquake (1976).[1)] As the relief process involved a broad range of types of social capital, particularly from NPOs around the country (Liu et al. 2014; Zhao 2011), many media sources and scholars dubbed 2008 "Year 1 for volunteerism in China" and used this as a model for "state-social" cooperation (Liu 2011). Despite this, this study's analysis revealed that social capital in the relief and reconstruction process after the Sichuan Earthquake took a top-down approach. This paper concretely analyzed the state of social capital in the 2008 Sichuan Earthquake from the perspectives of the three types of social capital.

The data in this section were obtained from academic research into the role of social capital in the Sichuan Earthquake, media reporting, and statistical data from two social surveys presented by the Chinese Academy of Science and Technology for Development (CASTED). The first survey was the "Rapid Survey on Resident Needs in Disaster-Affected Areas from the Wenchuan Earthquake"

conducted by CASTED in July 2008 (Wang et al. 2008). This survey covered 26 counties (cities and districts) that were affected by the disaster and investigated 144 settlements and 4526 households. The second survey was the "Reconstruction Survey of Residents in Disaster-Affected Areas from the Wenchuan Earthquake," conducted by the same research team in July 2009 (Zhao 2009); in general, it used the survey framework from the 2008 survey and selected 142 communities (villages, neighborhood committees, urban communities) and 29 temporary residences from the 26 counties (cities and districts) that were most severely affected, to interview residents from 5549 households. These two surveys covered various topics, including housing and infrastructure, basic demographic information, labor and employment, household budgeting, social interaction, social relationships, and policy needs, and they reflected the production, lifestyle, and social recovery of residents in disaster-affected areas comprehensively. Both surveys measured indicators relating to disaster-affected residents' social capital and used them as the basis for analysis.

According to the surveys, first, the bonding social capital within the community had broken down. In disaster response and relief after the disaster, networks of personal relationships, such as family, relatives, and friends, played an important role (Zhao 2011; Fu 2010). According to the 2008 social survey data (see Fig. 1), 40.2% of residents received assistance from friends and relatives in the first month after the earthquake. This assistance includes provision of essential items for life, psychological support, and home rebuilding. After government assistance, this had the highest proportion. At the same time, according to data from the 2009 social survey (Zhao et al.), 53.7% of residents thought that assistance from friends and neighbors was extremely important. At this point, assistance from relatives and friends had surpassed support from the government to become a major source of support for residents. Thus, we can conclude that bonding social capital played an important role and provided significant support to disaster-affected residents after the Sichuan Earthquake. However, community organization and resident self-organization, which is a key manifestation of bonding social capital, were almost nonexistent (Zhao 2011; Zhu 2009). This was also reflected in the reconstruction process following the disaster (Luo et al. 2014, 2017). Luo et al. (2014; 2017) conducted an analysis of a long-term follow-up survey of community recovery after the Sichuan Earthquake and used quantitative survey techniques in a statistical analysis of social capital following the disaster. The results revealed the following. The majority of disaster-affected residents had comparatively abundant bonding networks, such as family and friends. However, as the role of self-organization of the community was small in the reconstruction following the disaster, the rebuilding in many small-scale villages was less efficient, and various disputes arose. In other words, bonding social capital through family, friends, and close neighbors played an important role, but because these networks operated spontaneously and independently and were not organized as a whole, their effect as bonding social capital was partly diminished. The lack of organizational cooperation and collaboration formed a limitation on disaster response.

Next, we considered bridging social capital. As discussed above, 2008 was "Year 1 of volunteerism" in China. According to Table 1, support from volunteers and NPOs was also extremely important for

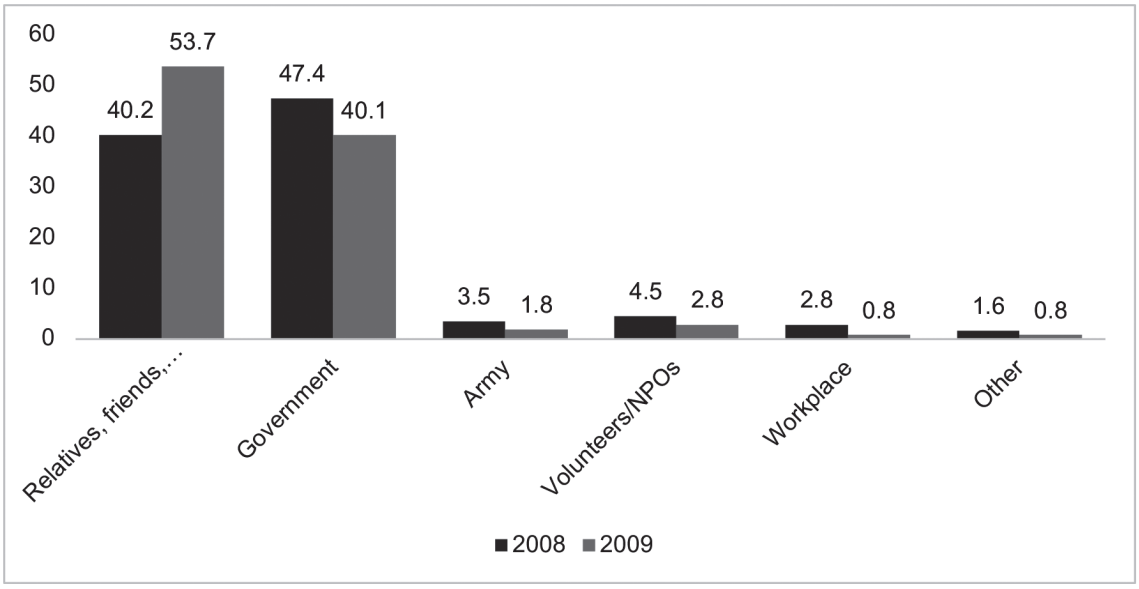

Figure 1. Support sources for residents affected by the Sichuan Earthquake (unit: %)
Source: Created by the authors from data from Wang et al. (2008); Zhao et al. (2009)

residents in disaster-affected areas, occupying third place among the support that residents received in both 2008 and 2009. However, opinion was divided on the activities of social networks and organizations across the community. In the Sichuan Earthquake, many NPOs and individuals participated as volunteers and stimulated volunteer activities, but many studies have demonstrated that bridging-type disaster relief organizations that cross the community like this are insufficient in terms of both quality and quantity. The specific details are set out below.

(1) There are few social organizations, they lack collaboration with the government, and they are insufficiently funded (Liu 2011).

(2) Many spontaneous relief actions are passive. In particular, horizontal systematic ties are lacking. Specifically, as some studies point out, the phenomena of "imperfect cooperation" (Zhu et al. 2014) and "nonexistent social organizations and systems" (Zhu 2009) are observed in NPO actions. For this reason, participation by social organizations is deemed "unsystematic" (Shi et al. 2013; Teets 2009).

(3) Most NPOs involved in disaster relief are external organizations, which makes it more difficult to conduct relief activities. In other words, external organizations cannot play the role of local cross-community organizations.

These phenomena are nonexistent in horizontal social and systematic networks, demonstrating that bridging social capital is rare. This caused confusion in disaster responses between different communities, forcing them to rely on government assistance. In disaster relief following the Sichuan Earthquake, the government needed to intervene and build horizontal systematic ties and coordinating networks in order to effectively handle disorder and confusion and to provide effective disaster relief.

Finally, we examine the state of linking social capital. Linking social capital mainly indicates vertical relationships between communities and the government, for example. According to data from the two social surveys, government support played a major role following the earthquake. In July 2008, immediately after the earthquake, support from the government was the most important social support for disaster-affected people. However, after 2009, the proportion of support from the government fell below the bonding social capital from relatives, friends, and others. Looking at survey results from other data, linking social capital in the Sichuan earthquake was far from abundant. Two specific points may be raised in summary.

(1) Trust relationships between the community and government authorities are weak. As shown in Table 1, the degree of residents' trust in the central government is comparatively high (3.70) and close to that in family (3.87). However, feelings of trust in the regional governments in townships, towns, and subdistricts are comparatively weak (2.87), and lower than the degree of trust in neighbors (3.26) and volunteers (3.47). In other words, while the central government's policies are trusted, the degree of residents' trust declines at lower levels of government, and the relationship between regional government and residents is the worst. This reflects the current state in which some central government policies have not been completely implemented in the regions. Luo et al. (2014) also note that many disaster-affected villagers have feelings of mistrust in township, town, and subdistrict governments and that it is difficult to form cooperative networks with the government.

(2) Communications between the government and NPOs and other relief organizations were not smooth, and many NPOs encounter more resistance in disaster relief. Vertical link networks were mostly found only in government agencies. This refers to orders and directions from superior organizations to inferior organizations within the government.

In summary, the social capital found in disaster-affected areas after the 2008 Sichuan Earthquake presented a comparatively low degree of development, and none of the bonding, bridging, or linking types of social capital were abundant. However, the strong leadership of the Chinese government enabled rapid and efficient recovery after the Sichuan Earthquake.

3.2. The 2011 Great East Japan Earthquake

The Great East Japan Earthquake occurred on March 11, 2011. According to official data published in 2021, the damage was 19,747 deaths, 6,242 injured, and 2,556 missing.[2)] Japan frequently experiences natural disasters; it has therefore perfected a comprehensive disaster response system. Examining the Great East Japan Earthquake from the perspective of social capital reveals that disaster response capacities improved as a whole. This section analyzes the conditions in the Great East Japan Earthquake with regard to the three types of social capital. The data in this part have been obtained from academic research into the role of social capital in the Great East Japan Earthquake, media reporting, and statistical data from several social surveys. The data used were mainly obtained from the Statistical Database on the Great East Japan Earthquake provided by the International Research Institute of Disaster Science,

Table 1. Degree of trust of residents in areas affected by the Sichuan Earthquake (2009) (unit: %)

Focus area	Completely trust	Comparatively trust	Do not trust much	Mistrust	Mean score
Family	87.4	11.9	0.7	0.0	3.87
Neighbors	32.5	61.0	6.0	0.5	3.26
Central government	74.7	22.1	2.2	0.9	3.70
Township/town/subdistrict government	31.4	34.4	23.7	10.5	2.87
Community administrators	25.9	38.2	21.7	14.2	2.76
Volunteers	50.9	45.7	3.2	0.2	3.47

* Calculation method for mean score: Completely trust, 4 points; Comparatively trust, 3 points; Do not trust much, 2 points; Mistrust, 1 point. Source: Created by the authors from Zhao et al. (2009)

Tohoku University, the "Survey on Residents' Autonomous Disaster Prevention Awareness" conducted by the Senshu University Center for Social Capital Studies in disaster-affected areas in the 2011 academic year (Harada 2012), and "A Report of Social Capital and its Correlation with Recovery Processes" published by the Japan CSO Coalition for Disaster Risk Reduction (JCC-DRR).[3)]

Regarding bonding social capital, Kawamoto (2015) found that most people affected by the Great East Japan Earthquake received help from friends, relatives, and neighbors. As disaster education and training had spread throughout most communities, many disaster-affected communities benefited from having better information and knowledge and could begin disaster rescue activities and obtain relief items more easily (Watanabe 2016). According to the Senshu University statistical data (Harada 2012), 60% of disaster-affected residents evacuated from neighboring areas. The JCC-DRR report describes the case of Akasaki-chō, Iwate, and concludes from the strength of the community's self-organization that bonding social capital had developed. Akasaki-chō, which had been famous from before the earthquake for its disaster prevention training, had neighborhood associations in 13 districts with a community hall chief at the center of each, and the emergency evacuation centers had instructions such as "seven officers below the leader were nominated from among the evacuating residents, and their roles were strictly divided, among other steps to make the command structure clear, and we shared the condition that changed from day to day with all residents living at the evacuation center each morning at the morning meeting and took the greatest care to prevent a sense of unfairness arising when distributing aid materials." From this, we can infer that communication between residents was strong, the division of roles was clear, and residents had greater self-organization capability. The richness of the bonding social capital manifested in the disaster response, disaster relief, and post-disaster reconstruction. After the Great East Japan Earthquake, many disaster-affected communities became aware of cooperation in the form of "collaboration with ties" (Kawamoto 2015). According to Harada (2012), volunteer activities and community activities increased in many areas after the earthquake. Group activities such as these strengthen community bonds and were greatly significant for psychological recovery, in addition to helping disaster-affected people quickly recommence their daily lives. The

survey by Kawawaki (2014) of the disaster-affected Iwate, Miyagi, and Fukushima prefectures concluded that the rich community activities and close links within the community generated closer social networks and social capital and were an element that resolutely supported reconstruction following the earthquake. In summary, in the case of the Great East Japan Earthquake, not only did bonding social capital play an important role, but residents also organized themselves within the community. Moreover, the richness of activities initiated from the residents' self-organization contributed to regenerating bonding social capital and formed a positive cycle.

According to the surveys, bridging social capital was also found in abundance. This mainly indicates the presence in large numbers of NPOs and other social network organizations. According to the study by Hayashi (2020), volunteers and local and national NPOs played an important role in relief and recovery through collaborative regimes, such as citizen participation, in the Great East Japan Earthquake. In the first month after the Great East Japan Earthquake, more than 117,000 volunteers were involved in disaster relief.4) Many of these volunteers and NPOs were involved in relief activities in the 1995 Great Kobe Earthquake (Watanabe 2012). In the same way that the Great Wenchuan Earthquake in 2008 was called "Year 1 of civil society" in China, the Great Kobe Earthquake in 1995 was called "Year 1 of volunteerism" in Japan. Various disaster relief NPOs appeared after the 1995 earthquake, but many of these volunteer organizations were not transient; they later participated in disaster relief activities in Japan and in other countries and accumulated rich experience. This was leveraged in disaster rescue for the Great East Japan Earthquake and greatly improved the efficiency of disaster relief. In addition, it became possible for different NPOs to collaborate more flexibly, and this became institutionalized (Watanabe 2012). Besides this, the JCC-DRR report shows frequent interactions beyond district borders in disaster-affected areas. For example, the city of Ōfunato held city-level major events and festivals for broader interdistrict interactions beyond the neighborhood associations. In addition, each district (neighborhood association) had a custom of holding a festival every four or five years and welcoming guests from other districts. This also created opportunities for interactions between districts. The leaders of each district knew each other by sight and formed relationships that allowed them to rely on each other easily in an emergency; hence, when urgent need arose, for example, the fire department from the district not affected by the disaster would rush to carry out relief activities, or the district affected by the disaster would request support. The interactions within ages, genders, and districts through these festivals and events, and the interactions between districts themselves, could be considered the source for this highly localized social capital.

Finally, linking social capital was also abundant, but some studies point out that the government response and preparation for the 2011 Great East Japan Earthquake was insufficient compared with that for the 1995 Great Kobe Earthquake. For example, when the Great Kobe Earthquake occurred, a reconstruction plan was formulated one month after the earthquake. By contrast, the reconstruction plan for the Great East Japan Earthquake was established by the Reconstruction Agency on February 10, 2012, one year after the earthquake (Hayashi 2020). However, the government continued to provide systematic organization and guidance for disaster relief activities. After the Great East Japan Earthquake,

Table 2. Focus areas of trust by residents affected by the Great East Japan Earthquake (maximum of 5 points)

Family	Government (municipality)	Police & fire department	Volunteers	Resident self-organizations
4.333	3.880	3.731	3.648	3.529

Source: Created by the authors from data from Harada (2012)

authorities at each level, including the central government and local government, established partnerships on equal footing with communities, local NPOs, and their networks to encourage support for disaster relief activities. For example, Japan's Disaster Relief Act imposes obligations on the Japanese Red Cross Society to provide blood plasma and volunteer groups to provide materials, etc., after a disaster; at the same time, it imposes an obligation on the Social Welfare Council to be involved in the disaster response manual for regional governments and to provide evacuation centers.[5)] A 2011 survey conducted by Senshu University summarized statistics on who disaster-affected people trust (Table 2). The results showed that disaster-affected residents trust the government second to their family.

Besides the government, which is trusted second only to family, disaster-affected residents eagerly interacted with experts and promoted reconstruction of their areas. JCC-DRR discovered from the survey it conducted in Miyagi that community-building experts participated regularly in disaster-prevention group relocation council meetings in the Urashima district of Miyagi and cooperated in residents' discussions on building a community through the mediation of the Japan International Volunteer Center (JVC). The Urashima district is located on the eastern side of Kesennuma Bay at a distance from the center of the city and was originally a strongly autonomous area. The expert advised and the residents decided on rules for building the community, such as the design for developing land for housing complexes and drawing borders between neighbors.

In summary, social capital can be inferred to have played an extremely positive role after the Great East Japan Earthquake. Bonding, bridging, and linking social capital were all in abundance and continued to function at the stage of disaster reconstruction as well. This allowed areas affected by the Great East Japan Earthquake to recover rapidly from the disaster and to surpass the levels they were at before the disaster.

4. Conclusion

4.1. Conclusion

This study used the concepts of social capital and resilience and their mechanisms to analyze the effectiveness of social capital after the 2008 Sichuan Earthquake and the 2011 Great East Japan Earthquake. The results show that the state of social capital after the Sichuan Earthquake was poorer than after the Great East Japan Earthquake. Causes for this may include Japan's greater experience with disaster management as well as differences in the political and economic backgrounds of Japan and

China.

Social capital in building disaster resilience in China shows fragmentary characteristics and has a marked tendency toward top-down operation. Specifically, bonding social capital plays an important role, but self-organization by community residents, a key manner of bonding social capital, was almost completely absent. The causes for this must be analyzed from the political structure in China. China's substratum governmental structure has been politicized (Cai 2005; Cai 2016), as markedly shown by the weakening of traditional system structures, such as the former communities and ethnic and religious groups, and their replacement with the government's system structures. For example, in the substratum villages, townships, and communities, committees consisting of residents have a far weaker right to speak than the officials of the substratum government, such as chairpersons and committee members.

Next, we analyzed bridging social capital. Advanced political infiltration also affects the activities of volunteer groups and NPOs. Spontaneous NPOs and government-supported NPOs are distinguished (Lin et al. 2011; Saich 2000); NPO activities are also restricted by law. Building cooperative relationships between the government and the community is therefore difficult.

Finally, looking at vertical linking social capital, China has a strong central government and strong bureaucracy, and the government has forcefully infiltrated and controls society as a whole. This has further reduced the right of communities, NPOs, and other organizations to speak. Residents affected by disasters indicated a sense of trust in the central government but a strong sense of mistrust in the lower levels of government. Recovery following the earthquake was completed rapidly and efficiently under the control of the administration. However, the government's advanced control and the current state of social capital are issues that cannot be ignored. Such unbalanced conditions are thought to be detrimental to fostering social capital.

Social capital in Japan after the earthquake was abundant overall and functioned from a bottom-up condition. In other words, self-organization by the local community was extremely well developed and played a major role after the earthquake. The inferred causes are Japan's long history of civil society and the establishment of relationships of coexistence between the state, society, and the local community (Ishida et al. 2014). In addition, the enactment of various laws and policies related to disasters has institutionalized and systematized cooperative networks and secured diverse, structured social capital types. These factors have greatly contributed to disaster resilience in disaster-affected areas. Besides these, residents' associations, neighborhood associations and the accompanying women's associations, associations for older adults, and other locally rooted organizations have played an important role in Japanese communities after the Second World War (Iizuka et al. 2008). Moreover, the Social Welfare Council is active in local government as an organization with a strong influence on administration. These organizations are considered to be involved with forming bonding social capital. On the other hand, the various citizen and NPO activities, concerning such areas as welfare, the environment, and education, strengthen norms of reciprocity in the participants, increase mutual trust, and reinforce networks, thereby playing a major role in forming bridging social capital.

4.2. Applications

Summarizing the findings of this paper, the structure of social capital may differ depending on the background of the political and social systems. When developing strategies for building disaster resilience, considering social capital's inherently contextual nature is important. By understanding the functions of social capital in specific political and social contexts and incorporating it into those specific institutional environments, objectively determining the potential effects of social capital, and avoiding detriments that may arise may be possible.

When developing strategies for building disaster resilience, diversifying the types of social capital used is necessary. Only when bonding, bridging, and linking social capital are in abundance (Szreter & Woolcock 2004) can vulnerabilities to disaster be mitigated and the ability to respond to disasters improved; focusing on the community's social capital is important. Community-level social organization and residents' self-organization are sources of social capital that are essential for post-disaster communities; for NPOs and other organizations to play an ongoing role after a disaster, there must be horizontal links with NPOs and vertical collaboration with administration.

4.3. Limitations

This study has some limitations. First, the analysis in this paper is mainly based on secondary materials; thus, the information may be incomplete, or some details may be missing. Second, this study analyzes the disaster management processes in two different political and social contexts but ignored to an extent the complicated conditions within the same context. Last, the part of this paper on prior research discusses the importance of social capital among various processes for disaster response (preparing before a disaster, disaster response, restoration after a disaster, etc.), but the case analyses favored relief and restoration after a disaster. It is necessary to conduct a more detailed investigation and deeper analysis in the future.

Notes

1) Report of 2008 Sichuan Earthquake, China Geological Survey https://www.cgs.gov.cn/ddztt/ddyw/wcdz/ (last accessed: September 28, 2023).
2) The Great East Japan Earthquake https://web.archive.org/web/20210309040708/https://www.fdma.go.jp/disaster/higashinihon/items/161.pdf (last accessed: September 28, 2023).
3) A Report of Social Capital and its Correlation with Recovery Processes https://jcc-drr.net/wpJD/wp-content/uploads/2018/06/jccdrr_social_capital.pdf (last accessed: September 28, 2023).
4) List of member groups of the Japan Civil Network for Disaster Relief in East Japan (JCN) https://jpn-civil.net/2014/about_us/members/ (last accessed: September 28, 2023).
5) Ministry of Health, Labor and Welfare, Disaster Relief Act

https://www.mhlw.go.jp/shinsai_jouhou/saigaikyuujo.html (last accessed: September 28., 2023).

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