

# Enhancement of disaster preparedness with social capital and community capacity: A perspective from a comparative case study of rural communities in Kochi, Japan

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## Abstract:

Social capital is defined as the factors promoting useful cooperative actions, such as social organizations and systems, norms, networks, people's sense of values, consciousness and beliefs, held by members of the community and/or concerned external parties. It is argued that social capital can play an important role in the enhancement of communities' disaster preparedness. Recently the importance of disaster preparedness has been widely recognized, and community based approaches have drawn significant attention. This paper attempts to clarify the key factors that local governments should take into account to in order to enhance a community's capacity for disaster preparedness, through field observations and surveys in rural communities in Japan. Surveys were carried out in two communities of Tosashimizu city of Kochi Prefecture, which was highly affected by a torrential downpour in 2001. After the experience of the 2001 disaster, different actions were taken in the two communities during the catastrophic disaster of Typhoon 23 in 2004. Through key informant interviews and qualitative comparison of the two communities, it can be concluded that aspects of social capital such as 1) *community leader's leadership*; 2) *community's bonds and networks*; and 3) *institutions and systems within the community* should be considered to enhance a community's disaster preparedness.

**KEYWORDS** Social capital; flood; community preparedness; rural communities; experience in Japan

## BACKGROUND AND ISSUES

There has been a significant increase in natural disasters over the last decade. In light of this, it has become apparent that developed countries, as well as developing countries, need to recognize the importance of taking anticipatory actions to prepare for disasters. Until the early 1990's, there has been a tendency to put emphasis on the engineering aspect in the approaches for disaster preparedness. However, through the "International Decade for Natural Disaster Reduction (1990–1999)," the importance of social as well as engineering aspects has been gradually recognized. At the United Nations World Conference on Disaster Reduction (UNISDR, 2005), the Hyogo Framework for Action (2005–2015) was adopted, which states the importance of developing and strengthening capacities at all levels. Community participation has been especially emphasized as a factor which systematically contributes to

building resistance to hazards.

Japan is known for its vulnerability to disasters. For example, Japan is ranked fourth in the world in the evaluation of physical exposure to tropical cyclones (UNDP 2004). Since the experience of the Kobe earthquake there has been an increasing awareness of the importance of the social aspects of disaster preparedness, in particular community's capacity to respond. The Japanese government amended the "Basic Policy" in the "Basic Act for Disaster Countermeasures" and added the importance of communication and participation between residents and local government as well as amongst the residents themselves. Local governments have promoted establishing "Jishubosaisoshiki" (voluntary disaster preparedness organizations) in order to improve community based disaster preparedness. However, they have given priority to increasing the number of the organizations rather than to promoting activities in accordance with each community's circumstances and ideas. Therefore, there are many cases where community based activities were stagnated. The key question is what local governments should take into account to promote successful implementation of community based disaster preparedness activities.

Disaster management has become closely connected to various fields such as environment, city planning, and community participation in recent years. A recent argument of the importance of civil society for community development explains that the safety of a community should be discussed and determined by the community, since they (the community and/or individuals within it) should be responsible for their own safety (Shaw and Goda 2004). In the Kobe earthquake, it was individuals and neighbors who saved most of the residents' lives. Kurata (1999) indicates that in the Kobe earthquake, rescue activities in usually "intimate" communities were smoother than that in "less intimate" communities, since community based disaster preparedness requires residents' cooperation and coordination. Recently, Social Capital (hereafter referred as "SC") has come to be known to encompass the functions that promote such cooperative actions. Therefore, it can be said that improving SC in community based disaster preparedness would be desirable. For example, Nakagawa and Shaw (2004) highlighted that SC played an important role in the process of reconstruction in the Kobe earthquake of 1995 and the Gujarat earthquake of 2001. Despite these observations, studies regarding SC in disaster management have been limited.

Therefore, drawing upon a series of field studies from the Kochi Prefecture in Shikoku Island of Japan, this paper attempts to clarify the key factors that enhance a community's capacity for disaster preparedness from the viewpoint of SC and to suggest what local governments should pay attention to when improving a community's capacity for disaster preparedness. The

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Received 17 May 2007  
Accepted 30 July 2007

paper follows on from a previous study by Mimaki and Fujikura (2006), which illustrated the role of SC in disaster preparedness from the viewpoint of Japanese Official Development Assistance. This study is considered from the viewpoint of the Japanese local government.

## DEFINITION OF SOCIAL CAPITAL

The concept of SC is currently receiving a lot of attention from development agencies and research institutions. In addition many studies regarding SC have been conducted. SC is recognized as “the basics of governance in the economic society of the present age” (Miyagawa, 2004).

However, there are various definitions of SC. It can be defined as “...features of social organization, such as trust, norms [or reciprocity], and networks [of civil engagement], that can improve the efficiency of society by facilitating coordinated actions” (Putnam *et al.* 1993). The World Bank (2000) has defined SC as “...the institutions, relationships, and norms that shape the quality and quantity of a society’s social interactions”. Narayan (1997) has defined SC as “...the rules, norms, obligations, reciprocity and trust embedded in social relations, social structures and society’s institutional arrangements which enable its members to achieve their individual and community objectives”. The analysis of Putnam *et al.* (1993) provoked controversy among many social scientists especially in the field of development. Studies on SC have proliferated since then, and the theory has been applied to different disciplines. Putnam (2000) focuses on the function of SC and distinguishes between bonding and bridging. He states that bonding relates to SC within a community of individuals who already know each other. On the other hand, bridging refers to connections among individuals who did not know each other previously. Bonding in SC is good for building specific reciprocity and mobilizing solidarity within a community. Bridging, by contrast, is better for building links to external assets and for information diffusion. As more detailed analysis has been conducted, several categorizations of social capital have emerged. Uphoff (1999) distinguishes between “structural” and “cognitive” SC. Structural SC involves various forms of social organization, including roles, rules, precedents and procedures, as well as a variety of networks that contribute to co-operation. Cognitive SC includes norms, values, attitudes and beliefs. Structural and cognitive SC is complementary: structures help translate norms and beliefs into well coordinated goal-orientated behavior.

It is widely agreed that SC facilitates mutually beneficial cooperative action, and there are various ways in defining SC. In this paper, SC is defined as “the factors which promote useful cooperative actions such as the social organizations and systems, norms, networks, people’s sense of values, consciousness and beliefs held by members of the community and/or concerned external parties”. In this case study, the analysis is conducted from the viewpoints of four types of SC, “bonding”, “bridging”, “structural” and “cognitive” SC.

## METHOD

Tosashimizu-city, Sukumo-city and Otsuki-cho, located in the southwestern part of Kochi prefecture were heavily affected by floods caused by the autumn rain front on 6 September 2001. The cost of the resulting damage was 18.8 billion yen, with 270 houses inundated above the floor level (full inundation) and

352 houses partial inundations (below the floor level). However, in spite of this devastation, there were no casualties and mass media reported it as “a miracle” and noted the “contribution of bonds among residents.”

In this paper, two communities of Tosashimizu city were studied. Three years later (in 2004) when Typhoon 23, which was the largest in the observational history in Japan, attacked Tosashimizu city, there was a difference in the residents’ behavior between the two communities. To identify the reason for the difference, a comparative study of the two communities was performed. Field work was carried out in Tosashimizu city in November 2004, September and December 2006. Interviews were conducted with residents (including the leader and members of the firefighting group), elementary school teachers, school children, the Mayor and officials of Tosashimizu city and Kochi prefecture. In these interviews, their activities related to disaster preparedness since the 2001 disaster were discussed and reviewed. The review method was qualitative, since it was necessary to understand the underlying reasons for an existing situation, to provide insight into the setting to analyze the circumstances of existing problems, and finally to extract the key factors necessary for disaster preparedness. In addition, in the process of the analysis, the reports drawn up by the Ministry of Land, Infrastructure and Transportation (MLIT) were reviewed.

## CASE STUDY: RURAL COMMUNITIES IN TOSASHIMIZU CITY

### *General Conditions of the Area*

Tosashimizu city is located about 170 km southeast from Kochi city (prefectural seat). This area is known in Kochi prefecture for its “strong bonds among residents”. According to previous studies (MLIT, 2002), over 90 percent of residents responded that they knew members of neighboring families, and over 50 percent people responded that they had been living in the area over 30 years.

In this study, two communities Kainokawagou (hereafter referred as “Community A”) (48 households, 97 people as per the 2004 Census) and Shimokawaguchiura (hereafter referred as “Community B”) (146 households, 357 people) were selected from the communities damaged by floods in 2001. The criteria for the selection were similarities in natural and social environment. Both communities are surrounded by coast and mountains and are considered as “rural communities”, and in both communities an aged population (over 65 years) occupies over one-third of the population. In addition, in the flood disaster of 2001, there were some common points regarding damage and residents’ evacuation. In both communities, when many houses were inundated, community leaders and firefighting group leaders warned residents of the impending risk and residents subsequently warned each other; therefore many residents could take refuge and there were no casualties.

### *Situations of the communities from September 2001 to November 2004*

*Community A: Activities for disaster preparedness after the Disaster-2001 to November 2004.* Two months after the disaster, in an interview of MLIT, the leader commented that he had fear of further rain and that it was necessary to re-examine the location of the evacuation center because some residents could not reach the evacuation center due to inundation of the access route. The same person continued to be the leader until the 2004 disaster, but neither the leader nor the community

took any action to rectify the problem.

The community firefighting group was acclaimed by the residents for their good performance in the 2001 disaster. However, some young residents hesitated to become members of the firefighting group, commenting that “We will not be active like them,” and “The members have to think of the community’s benefit over personal matters. So, the activity will be painful for us”. There were 11 members in the firefighting group in 2001, which was far below its required number of members. Therefore, two neighboring firefighting groups were merged to form a larger community firefighting group of 22 members in the 2004 disaster. However, there were no major changes in the training programs (fire drills every two months).

*Community B: Activities for disaster preparedness after the Disaster-2001 to November 2004.* The community leader (incepted in 1995) took a lead in the process of evacuation and recovery in the 2001 disaster. Through the process, he communicated with various people and recognized the importance of daily communication and mutual help in the community. Most of the residents were rescued and helped by their neighbors, since they had detailed information on the daily lifestyles of their neighbors. The leader recognized the importance of self-help and awareness about different types of disasters through the community activities. Thus, the leader started to appeal to residents and to Tosashimizu city government (hereinafter referred as “local government”) about the importance of the disaster preparedness.

Community B’s firefighting group also gained a good reputation among residents and was expected to play a more active role in disaster preparedness. The firefighting group members became worried that residents would depend on them excessively. Therefore they decided to instruct residents about the importance of self-help and to build a new emergency network in cooperation with the leader and residents’ groups. In the process of their activities, residents also changed their perception and behavior. Previously, residents had thought that disaster preparedness was a local government’s duty, but they came to recognize that they themselves need to be conscious. A self-help declaration was made by the residents one month after the disaster. In this way, the leader along with the community members conducted various activities until November 2004. The following are examples of these activities.

a) Establishing an emergency network

In the case that a disaster might occur in the absence of the firefighting group, they built a new emergency network in cooperation with existing groups such as the women’s group and the senior residents’ (over 65 years) group. In case of an emergency, each group is expected to play their role.

b) Voluntary disaster preparedness organization and its activities

Since 1998 the local government had been promoting policy for the establishment of voluntary disaster preparedness organization in all communities. Community B prepared a draft of the rules of the organization in August 2001 (before the disaster). They reexamined the rules based on their experiences, and then formally established it in January 2002 and promoted various activities. By utilizing the local government’s financial support, Community B equipped their evacuation center. The cost was shared between Kochi prefectural government and the local government. Traditional local knowledge was utilized to decide an alternate evacuation center, in case of the designated center could not be reached. The evacua-

tion route was equipped with handrails, so that senior citizens can evacuate smoothly. Guiding signs were also placed. Hazard maps and the evacuation route map were distributed to all residents.

c) Setting a “Day of Disaster Preparedness”

The community designated 6 September (the day of 2001 disaster) as the Day for Disaster Preparedness, so that disaster experiences would not be forgotten. An evacuation drill was conducted on this day in 2004, in cooperation with the elementary school and residents of another community.

d) Visiting senior residents living alone

After the evacuation drill, the fire fighting group, police, the local government officials and the members of board of the community visit homes of senior residents living alone. Communication with the senior residents was facilitated through this process, and it was enhanced by a community meeting with participation from wider sectors of the community.

*Institutions concerned with Community B: Activities for disaster preparedness after the Disaster-2001 to November 2004*

a) Elementary school

The school building was inundated in the disaster of 2001. The teachers started to restore the building and investigate the damage situations of school children. Through the process, the teachers came to know how community B’s leaders and firefighting group played an important role in the disaster and how the residents were able to survive. The principal of the school realized the importance of strengthening the relationship with the community, and he decided to restart school soon so that residents could proceed with restoration activities.

One month after, the school introduced a new education policy intended to raise school children’s awareness of the value (“treasure”) of their community’s bond and a quick moving firefighting group. School children conducted an interesting and innovative survey with the community members through inspection, discussion, interviews and observations. In summer 2004, when Niigata prefecture and Fukui prefectures suffered from flood damage, they exchanged their experiences with the affected schools, and this cross-communication gave them an opportunity to work with the local communities.

b) Local government (Tosashimizu city)

The local government has a support system for establishing voluntary disaster preparedness organizations. Therefore, when Community B established one, they supported it in cooperation with the Kochi prefectural government. In addition, the local government official participated in “home visits for senior residents living alone” with other people concerned.

*The response of the two communities to Typhoon 23 in October 2004*

Almost every year typhoons and rain storms attack this region. Consequently, both communities’ residents have accustomed themselves to these phenomena and are used to remaining in their home until the storms pass away. In other words, there was no difference in both residents behavior before the 2001 disaster. However, when Typhoon 23, which was the largest recorded event in the observational history at that time, attacked the region in 2004, there was a difference in the residents’ behavior between the two communities. In Community A, residents remained at their home as



usual. In contrast, in Community B, some residents had taken shelter in the evacuation center before the typhoon arrived. Because people tend to be optimistic in times of disasters, people relatively reluctant to evacuate during a flood (Tazaki, 1988). It can be said that Community B's awareness has been improved through various activities after the 2001 disaster.

*Disaster preparedness activities of the two communities from November 2004 to December 2006*

*Community A's situation (as of December 2006).* After the disaster, the community leader changed twice in accordance with the community's rule. In 2005, a voluntary disaster preparedness organization was established with the support of the local government. However they did not conduct fire drills. They had a plan to do it during the fiscal year 2005 in cooperation with a neighboring community but the plan was not implemented. The residents explained that they had been too busy with the funerals of residents. Except the local government, there is neither a community organization nor a strong network between community and external institutions (school etc.) which could have promoted the event.

*Community B's situation (as of December 2006).* Though five years have passed since the disaster, the community continues to conduct various activities. Residents' consciousness seems to be sustained. When a typhoon or rainstorm is predicted, the leader and the firefighting group warn residents by radio and telephone. When required, the residents concerned with disaster preparedness have meetings. In 2005 the leader gave a lecture about disasters to school children in the elementary school. At the class, he explained about the community's disaster experiences and history of disasters since 1600. Through the class, school children recognized that community's bonds and mutual help contributed to save residents' lives. These experience sharing events took place in conjunction with entertainment activities (e.g. the "catching eels" event) to promote school children's interests.

*Discussion and Analysis*

*Reasons for the increase in community preparedness.* As of November 2004, Community B's capacity for disaster preparedness improved. To investigate the reasons, the following three issues are analyzed (as of 2004).

a) Leadership of Community B's Leader

The present (as of 2004) leader is the same person as it was in 2001. He has been the leader since 1995. In Community B, the leader is selected by election. The roles of this leader are to discuss policies with the local government, to advice residents, to manage various community events, to collect residents' fee and to distribute local government's monthly bulletin and receipts of charges for public services. In addition to being a leader of the community, he also works as social worker and a juvenile probation officer and thus he works to improve residents' "life". He publishes a monthly community bulletin to introduce different events and the new policies of the local government. He has various opportunities to deepen community communication.

Moreover, he has built and maintained good relationships with the residents, firefighting group, police, local government and elementary school over many years. Therefore he has established communication channels to both the community and external stakeholders. After the disaster, he recognized the importance of disaster preparedness and decided to appeal

to residents about disaster preparedness by means of utilizing existing "various communication channels".

b) Resident's Group: Fire fighting group

Community B's firefighting group has practice sessions periodically. They have monthly informal get-togethers, where they exchange community information such as topographical weak points, health conditions of aged and handicapped residents and characteristics of each household to determine who should be first priority in the case of an emergency. At the same time, their "sense of mission" has been expanded from experienced members to inexperienced members over these meetings. The group leader makes an effort to recognize each member's characteristics and to deepen communication among the members. In Community B, the young men's group dissolved about 20 years ago. Consequently the firefighting group now organizes community events such as festivals and KEIROKAI (a meeting to show respect for the senior residents). Through participatory activities they have established good relationships with residents.

c) Expansion of Network (internal and external)

After the disaster, the firefighting group had come to feel residents' dependence on them. Therefore they responded to their community leader's appeal. They established new disaster preparedness systems in cooperation with existing community organizations such as a women's group and a senior citizen's group. This approach led residents to improve their consciousness. Additionally, external institutions like the elementary school, police and local government, who had become aware of the community leader's enthusiasm, recognized the importance of disaster preparedness. This led to various activities, with participation from different sectors of the community. In other words, after the disaster, the community leader's zeal for the community had changed into enthusiasm for disaster preparedness. Through existing relationships it led to an internal and external network of people and institutions to improve community consciousness of disaster preparedness. In addition, the financial support of the local government and Kochi prefecture worked as an incentive for activities, and it led to further improvement of their consciousness.

*Analysis from the viewpoint of Social Capital.* After the disaster Community A merged their firefighting group with other communities' groups and its network was expanded which can be regarded as the "bridging" SC. However, "cognitive" SC such as "necessity of re-examination of the evacuation center", "fear of rainfall" and "evaluation of firefighting group" was not recognized for disaster preparedness. Young people's hesitation in participating as members of firefighting ("cognitive" SC) emerged. It can be considered as a negative output of SC.

On the other hand, in Community B, the leader utilized his good relationships with the community and external people concerned ("bonding" and "bridging" SC) and his enthusiasm for disaster preparedness ("cognitive" SC) was transmitted to them through various communication channels ("structural" SC).

In addition, the local government's financial support system ("structural" SC) worked as an incentive and led to the establishment of a new organization ("structural" SC). It brought about an expansion of community relationships ("bonding" SC) and new relationships with external peoples concerned ("bridging" and "cognitive" SC). Therefore, it is considered that Community B's improvement of consciousness of disaster preparedness

are due to the following factors:

- Existence of leader with enthusiasm for disaster preparedness
- SC which forms the base for the community's capacity for disaster preparedness
- Organizations and systems which promote the expansion of existing social capital and the formation of new SC.

## CONCLUSION

*What factors should be considered for improving the community based disaster preparedness by local government?*

In this paper only one case is analyzed through field survey and qualitative interview. Although it is difficult to generalize, it is clear in this example that the community's SC contributed to enhance the community's capacity for disaster preparedness. The following points should be taken into account by local government:

*Raising community leader's consciousness for disaster preparedness.* Provision of various opportunities such as training programs for leaders in order to raise their consciousness will be useful. The following points should be included in the program:

- Importance of daily communal communication (among residents and between communal organizations and residents); and
- Estimated damages to the community.

*Recognition of SC concerned with disaster preparedness.* Before making any decision regarding the establishment of a voluntary organization, the following concerns regarding SC for disaster preparedness should be examined to identify factors that promote (or restrict) community activity:

- If a communication network does not exist within the community, measures which will contribute to deepen community communication should be examined;
- Characteristics and notion of leader ("cognitive" SC);
- Residents' (including leader and the communal organizations) consciousness of natural hazards ("cognitive" SC);
- Decision making process and communication within the community (formal and informal);
- Role of community governance in the community; and
- Existing residents' group in the community and relationship with residents.

*Support for expansion and formation of SC.* Based on the following points, the local government should formulate and implement policies that will expand SC of the community:

- The method of communication between community and local government; and
- Existence of external institutions that have a relationship with community (e.g. NPO, school etc.).

However, as Albee and Boyd (1997) argue, *there is no single answer or model to promoting participation ... there are only frameworks and guiding principles.* SC does not have a concrete definition, and it varies its function depending on the situation. In other words, a universal method of formation of SC may not exist. Therefore, in the process of activities at community levels, each community's SC and its social condition must be considered and the activities should be re-examined flexibly. In summary, it can be stated that following elements are required for community preparedness.

## *Issues to be considered in the future*

According to the studies conducted in 2006, Community B's residents have come to value the community's activation through initiatives of disaster preparedness. After the disaster, they decided to take more care of the children of the community. They held some events for the school children utilizing each residents' special abilities and hobbies in cooperation with the elementary school. The leader said that it became easier to ask for someone's support for the event than before the 2001 disaster. Through such events the behavior of the school children has been changed, and they have become interactive with residents. Moreover, the senior residents have felt a "sense of safety". Narayan and Pritchett (1997) describe the importance of *co-operative action in solving problems with a local "common property" elements.* Nishide (2005) indicates that SC has been recognized as a key of *chiikiriyoku* (power of the community) that influences civil society. In other words, it suggests that activities for disaster preparedness based on community's social capital may lead to better community management. In 2005, in "Basic act for disaster countermeasures", the Japanese government added "support for senior residents" as a necessary matter, and the importance of community based approaches was recognized. The necessity of supporting the senior residents has become more prominent in aging societies like Japan, and the solution requires accumulation of experiences focusing on social capital for effective approaches. Further studies from quantitative as well as qualitative aspects will also be necessary.

## REFERENCES

- Albee A., Boyd G. 1997. *Doing it Differently: Networks of Community Development Agents.* Scottish Community Education Council: Edinburgh; 3-24.
- Asahi shimbun. 2001. *Kizuna to jishu to [Bonds and voluntary]* 6 October Asahi shimbun, Tokyo (in Japanese).
- Kochi shimbun. 2001. *Fukkyuu Choukisen no yousou [Reconstruction-seems to need long time]* 9 September Kochi shimbun, Kochi (in Japanese).
- Kodomo Kochi shimbun. 2001. *Tsuyoi kizuna shisha dasazu [Thanks to strong bonds, there were no casualty]* 16 September Kodomo Kochi shimbun, Kochi (in Japanese).
- Kurata W. 1999. *Bousai Fukushi Community [Community of disaster prevention and welfare].* Minelvashobo: Kyoto; 1-21 (in Japanese).
- Mimaki J., Fujikura R. 2006. Improving Development Assistance Projects for Disaster Prevention-case studies on factors developing regional capacity for disaster prevention. *Journal of International Development Studies* 15(1): 39-58 (in Japanese).
- Ministry of Land, Infrastructure and Transportation Shikoku Regional Development Bureau and Kochi prefectural office. 2002. *Heisei Jusannen Kugatsu Muika Kouchiken Seinambu Gouusaigai Taikenshu "Sukuttano wa Hitono Tsunagari" [6 September 2001. A collection of the flood victims' compositions-what saved people was their bonds].* Ministry of Land, Infrastructure and Transportation Shikoku Regional Development Bureau: Takamatsu; 8-14 (in Japanese).
- Miyagawa K. 2004. Theory of Social Capital In *Social Capital; Gendai Keizaishakai no Governance no Kiso [Social Capital; the basics of governance in economic society of the present age].* Toyokeizaishinposha: Tokyo; 3-53 (in Japanese).
- Miyaniishi Y. 1986. Redevelopment Means Increasing Regional Power-Residents' Power and Urban Area Development-. *City Planning Review* 143: 25-33 (in Japanese).
- Nakagawa Y., Shaw R. 2004. Social Capital: A Missing Link to Disaster Recovery. *International Journal of Mass Emergencies and Disasters* 22(1): 5-34.
- Narayan D. 1997. *Voices of the Poor: Poverty and Social Capital in Tanzania.* World Bank: Washington, DC; 50-65.

- Narayan D., Pritchett L. 1997. *Cents and Sociability, Household Income and Social Capital in Rural Tanzania*. World Bank: Washington, DC; 4.
- Nishide Y. 2005. NPO and Social Capital. In *Nihon no Social Capital [Social Capital in Japan]*. Center for Nonprofit research and Information: Toyonaka; 5-18 (in Japanese).
- Putnam R. 2000. *Bowling Alone: The collapse and revival of American Community*. Simon and Schuster: New York; 22.
- Putnam R., Leonardi R., Nanetti, R. 1993. *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton University Press: Princeton; 163-185.
- Shaw R., Goda K. 2004. From disaster to sustainable community planning and development: the Kobe experiences. *Disasters* 28(4): 16-40.
- Tazaki T. 1988. Evacuation in case of volcanic eruptions and floods. In *Shizensaigai no Koudoukagaku [A behavioral science in Natural Disasters]*, Fukumura Shuppan Inc.: Tokyo; 75-83 (in Japanese).
- UNDP. 2004. *Reducing Disaster Risk -A Challenge for Development*. [http://www.pnud.org.ni/files/doc/RDR\\_EN\\_2004.pdf](http://www.pnud.org.ni/files/doc/RDR_EN_2004.pdf). Accessed: 26 July 2007.
- UNISDR. 2005. *Hyogo Framework for Action 2005 - 2015*, UNISDR, A/CONF.206/6.
- Uphoff N. 1999. Understanding Social Capital: Learning from the Analysis and Experiences of Participation. In *Social Capital: A Multifaceted Perspective*. World Bank: Washington, DC; 215-249.
- World Bank. 2000. *What is Social Capital*. <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTSOCIALDEVELOPMENT/EXTSOCIALCAPITAL/0,,contentMDK:20185164~menuPK:418217~pagePK:148956~piPK:216618~theSitePK:401015,00.html> Accessed: 26 July 2007.