The Role of Soft Control and Social Capital in Disaster Risk Management

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Introduction

Despite the fact that Japan is a beautiful country with four seasons, it is one of the worst countries in terms of disaster frequency, based on the country's occurrence probability of disaster risks and its social and economic vulnerability to disasters. For example, the Munich Reinsurance Group used the following three indicators to calculate disaster risk indices of major cities around the world in its 2004 publication.

(1) Degrees of disaster risks (hazards[1]): Occurrence probabilities of earthquakes, typhoons, flooding, volcanes and forest disasters.

(2) Vulnerability to risks: Measurements based on three indicators, such as structural characteristics, densities of houses and levels of safety measures in urban areas.

(3) Economic values exposed to risks (exposure values): Measurements based on indicators that are related to the scales of economic impacts, households and economic levels of cities.

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[1] "Hazards" originally meant the environmental factors (natural or physical and psychological) that affect the frequency or impact of risks which have loss occurrence probabilities. The term here accords with the definition by the Munich Reinsurance Company Ltd..

Chart 1 shows the calculated disaster risk indices of major cities around the world, based the above three indicators:
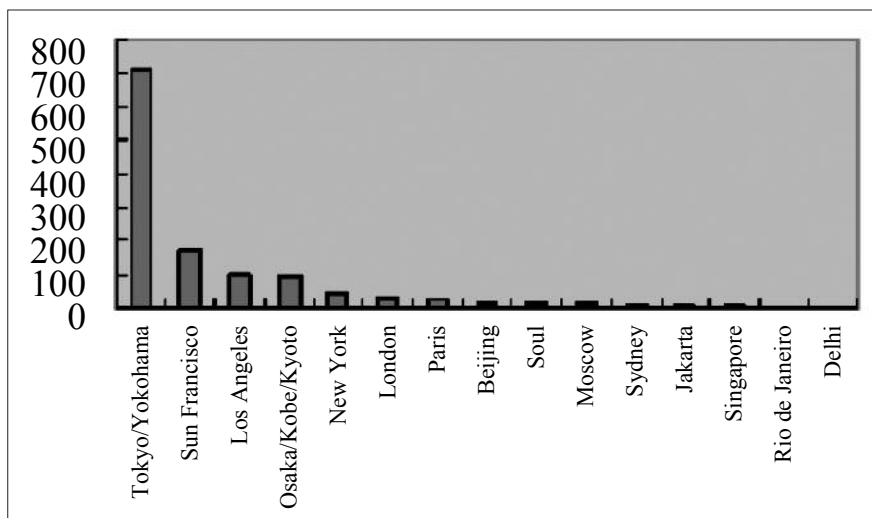

Chart 1: Disaster Risk Indices of the World

Reference: The Munich Reinsurance Group Annual Report

The comparison of disaster risk indices among international cities in Chart 1 suggests that Japan's five major cities -- Tokyo, Yokohama, Osaka, Kobe and Kyoto -- are dangerous places with such high degrees of disaster risks that they rank within the worst four areas in the world. Especially, Tokyo and Yokohama reached a disaster risk level of 710 which is much higher than the levels of the second and third worst cities, which are San Francisco with 167 and Los Angeles with 100. These results indicate that Japanese people are living in places with very high disaster risk indices.

These conditions can explain why the local people demanded the government to make disaster prevention policies their highest priority. Chart 2 shows a summary of nationwide interviews of 3,000 people with a minimum age of 20 years old, conducted by the Cabinet Office, regarding "policies expected by the local residents" (valid collection rate of 70.3%). This chart suggests that nearly 50% of the interviewees have expectations for "reinforcement of crime and disaster prevention policies."
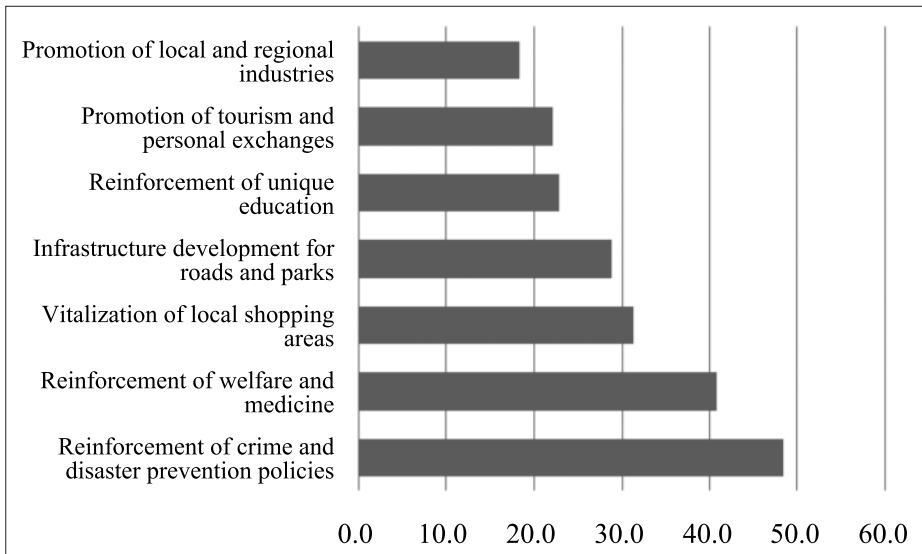
Chart 2: Policies Expected by the Local Residents

Reference: "The Special Opinion Poll on Regional Revitalization," The Cabinet Office, 2005

Remarks: Multiple answers were allowed. Total count: N = 921, M.T. = 261.7. The results of the seven items were extracted to develop this chart. The questions were changed as necessary.

The above facts, such as the assessment for Japan as one of the world's worst countries in disaster frequency and the strong expectation by the local residents for disaster prevention policies, suggest that it is important for us to consider effective management of disaster risks and policy development. Given these considerations, this paper discusses the characteristics of disaster risks, a framework for effective management of disaster risks and the roles of particular concepts, such as social capital and soft control, for disaster risk management.

1. Characteristics and Backgrounds of Disaster Risks

(1) From 1945 to 2009

Chart 3 shows a numeric list of casualties and missing persons due to natural disasters in Japan from 1945 to 2009.

Year	# of people	Year	# of people	Year	# of people	Year	# of people
1945	6,062	1962	381	1979	208	1996	84
1946	1,504	1963	575	1980	148	1997	71
1947	1,950	1964	307	1981	232	1998	109
1948	4,897	1965	367	1982	524	1999	142
1949	975	1966	578	1983	301	2000	83
1950	1,210	1967	607	1984	199	2001	90
1951	1,291	1968	259	1985	199	2002	48
1952	449	1969	183	1986	148	2003	62
1953	3,212	1970	163	1987	69	2004	327
1954	2,926	1971	350	1988	93	2005	153
1955	727	1972	587	1989	96	2006	177
1956	765	1973	85	1990	123	2007	39
1957	1,515	1974	324	1991	190	2008	100
1958	2,120	1975	213	1992	19	2009	100
1959	5,868	1976	273	1993	437		
1960	528	1977	174	1994	39		
1961	902	1978	153	1995	6,482		

Chart labels: Mikawa Earthquake (2,306), Makurazaki Typhoon (3,756); Isewan Typhoon (5,098); Kobe Earthquake (6,437); Fukui Earthquake (3,769); Nanki Rainstorm (1,124); Toyamaru Typhoon (1,761); Typhoon Kathleen (1,930)

Reference: The number in 1945 was the result of major disasters (based on *Rika Nenpyo* (the Chronological Scientific Tables)). The numbers in 1946-1952 were based on *Nihon Kisho Saigai Nenpyo* (the Annual Report of Meteorological Disasters in Japan). The numbers in 1953-1962 were based on materials of the Tokyo Metropolitan Police Department. The numbers after 1963 were based on materials of the Fire and Disaster Management Agency.
(Note) The casualties in 1995 include 919 deaths related to the Kobe earthquake (based on materials of Hyogo Prefecture). The numbera in 2009 are Preliminary (based on materials of the Cabinet Office).
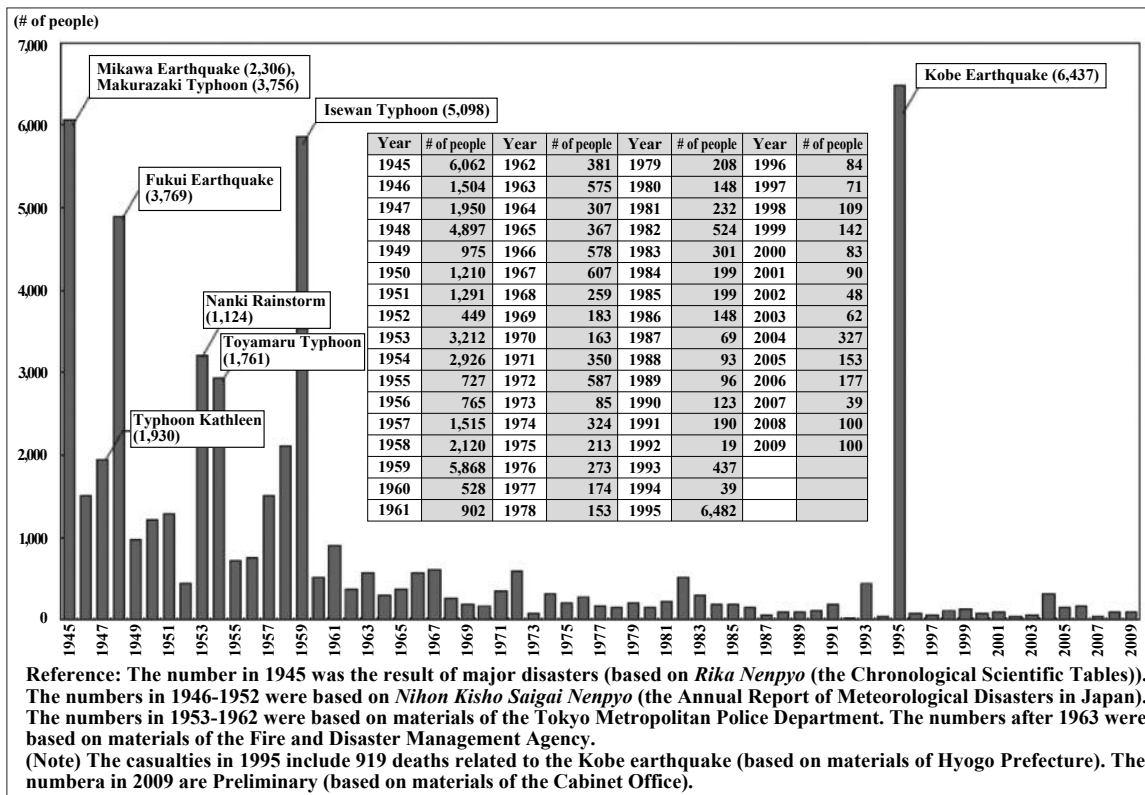
Chart 3: Numbers of Casualties and Missing Persons due to Natural Disasters

This chart explains the characteristics of occurrence frequency and impacts of natural disaster risks, especially including catastrophic disaster risks. In the period from 1945 to 1959, there were six catastrophic disasters (earthquakes, rainstorms and typhoons) which resulted in more than 2,000 victims as the total number of casualties and missing persons. This is simply calculated to be a frequency of 0.4 events per year.

In the fifty-year period from 1959-2009, there was only one disaster, the Kobe Earthquake which occurred in 1995, resulting in a frequency of 0.02 events per year.

In addition, other studies found that the number of earthquakes which caused damage to buildings (half or complete collapsed) was only eleven during the twenty year period from 1977 to 1998. Furthermore, only a single earthquake caused a 97.7 percent of the total damage to buildings due to these eleven earthquakes[2]: Kobe Earthquake of January, 1995 (Number of

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2 Nobuhiro Hiyoshi (2000), *Insurance and Risk Management,* Non-Life Insurance Institute of Japan, pp.12.

casualties: 6,482; Number of half/completely collapsed buildings: 100,000).

These statistical figures bring up a point that massive risks, such as earthquakes and typhoons, which could cause larger losses than other natural disasters, have an extremely low frequency of occurrence in comparison to other risks, such as traffic and fire accidents (the number of casualties due to traffic accidents in 2010 was 4,863). However, massive risks such as the Kobe Earthquake have a common characteristic: Once they occur, they cause extremely large losses.

The examination of natural disaster risks in Japan in terms of frequency and impact from 1945 to 2009, which is a period of about sixty five years, also explains that the number of casualties in the relatively recent years became very small in comparison to those up until 1959, except in 1995 when Kobe Earthquake occurred (See Chart 3). The following explanation summarizes characteristics of massive risks from which we could learn some lessons:

➢ Japan has a decreasing trend in the number of casualties due to massive risks before March 11 in 2011.

➢ Although massive risks rarely occur, once they occur, they cause large damages. Especially, since the density of structures in urban areas is increasing in recent years, massive risks could have a deep impact on the areas.

➢ Massive risks can occur suddenly. Therefore, it is important for us to continue our efforts to share correct information among individuals, communities and the administration on a daily basis.

➢ It should be a priority to minimize the number of victims immediately after an occurrence of a disaster. To do so, it is important that communities firstly take self-help actions by supporting one another; and then the local authorities (such as the administration) support the communities in a desirable scenario. Subsequently, the focus of support should be shifted to provide financial and psychological cares for recovery of the victims.

By the way, Toshiaki Kamei, the chairperson of the Japan Risk Management Society, calls risks that are commonly and collectively incurred in every economic entity as "social risks." He describes, "'social risks' may be the facts, circumstances and factors which disturb and destroy peace, safety, affluence and equality; and may be commonly and collectively incurred in every economic entity. Such risks may occur due to natural environment, such as disasters, earthquakes and weather changes, and social environment, such as corporate misdoings, food accidents, corporate bankruptcies, the working poor, restructuring, crimes, violation of human rights, psychological crisis and so on[3]." He also mentions, "Such social risks cannot be overcome only by risk management in companies, the administration, educational institutions

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[3] Toshiaki Kamei (2007), *Theory of Social Risk Management,* the Japan Risk Management Society, pp. 9-10; and Kamei (2009), *Background of Social Risk Management,* the Social Risk Management Society, pp. 1.

and household. They should be handled beyond the range of risk management for individual economic entities. Hence, the idea of social risk management must be introduced for mutual coordination of these entities[4]."

(2)The Great East Japan Earthquake on 11 March in 2011
Around 2:46pm on March 11, 2011, a massive earthquake with a magnitude of 9.0 took place off the Sanriku Coast, Northeast Japan. The ensuing tsunami swept across many cities and villages along the Pacific coast of the Tohoku (Northeast) region, causing tremendous human and physical losses. The number of deaths has amounted to 15,382, and that of missing 8,191 (by June 8, according to the National Police Agency). In total 154,486 people have evacuated from the stricken area (by June 2, according to the Fire and Disaster Management Agency).

Since 1700, Japan has experienced 14 earthquakes with a magnitude over 7.0. Of them, the earthquake of March 11 this year, now called the Great East Japan Earthquake, is the most powerful known earthquake to have hit Japan, and one of the five most powerful earthquakes in the world overall since the start of modern record-keeping in 1900. The earthquake triggered extremely destructive tsunami waves of up to 38.9 meters, in some cases traveling up to 10km inland. In addition to loss of life and destruction of infrastructure, the tsunami caused a number of nuclear accidents, primarily the ongoing level 7 meltdowns at three reactors in the Fukushima I Nuclear Power Plant complex, and the associated evacuation zones affecting hundreds of thousands of residents. The overall cost could exceed US$300 billion, making it the most expensive natural disaster on record. Business in Fukushima and other prefectures has been severely affected by harmful rumors about nuclear radiation.

While mentioning it only briefly, I am not able here to analyse the Great Earthquake fully in relation to risk management, as this paper has mostly written before the earthquake. But I should like to discuss it more, especially from the perspective of soft control, in the next issue of this Journal.

The present paper will focus especially on disaster risks as social risks; introduce the new concepts of soft control and social capital to the conventional basic framework for disaster risks; and discuss a new framework for disaster risks in the subsequent sections.

2. Soft Control and Social Capital as Countermeasure against Disaster Risks
It is essential for effective risk management (hereinafter called, "RM") to adequately select and implement countermeasures against risks, although it is the most difficult type of decision to make in RM. A concept called "RM tool mix" is used in making an adequate selection of countermeasures against risks for effective RM.   This mix has two pillars: One is risk control (hereinafter called, "RC") and the other is risk finance (hereinafter called, "RF"). The former means various activities to control frequency and impacts of risks. The latter means financial

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4 Kamei (2007), pp. 2-3.

planning for a first party to take responsibilities, or to shift responsibilities to a third party by means of insurances, warranties and derivatives.

This paper focuses on RC among these countermeasures, against risks based on the RC/RF pillars. For example, risk transitions using insurance systems in RF are considered to be financial compensations after the occurrence of risks. This has a low possibility to affect individual behavioural patterns. On the other hand, the main area of RC activities is normally to prevent risks or to minimize the probabilities and impacts of losses due to risks. If the contents of RC activities are implemented in a relationship for improving motivation of the related parties or nourishment of desirable organizations or local cultures, it is possible that RC could contribute to the improvement of benefits, such as local revitalization and development of trust relationships and bonds among the related parties. In other words, RC activities not only could minimize losses due to disaster risks, but also could simultaneously maximize returns of any kind.

This paper aims to clarify the previously indicated point, "a possibility to pursue maximization of returns of any kind in minimizing losses due to disaster risks" through introduction of the concepts of soft control and social capital in RC activities.

2-(1) Concept of Soft Control[5]

The term, "soft control," has been used in at least two studies in Japan related to the field of RM or corporate governance. One was my theory of RM in corporate ethics[6]. The other was a theory of corporate governance focusing on the area of internal control[7]. This term was also used in a research study on internal control conducted by the State of Michigan in the United States[8].

Also, there are similar terms to "soft control," such as "soft law" and "soft power," used outside the fields of RM and internal control.

In addition to my partial explanation on the concept of soft control in the first volume of the *Shakai Kankei Shihon Kenkyu Ronshu* (*The Senshu Social Capital Review*) published in March, 2010, I would like to discuss this concept in more detail in this paper, along with an explanation of similar concepts.

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[5] This paper's discussion on the concept of soft control in Chapter 2 is based on an upcoming paper by the author, Kazuo Ueda, titled, "Significance and Importance of Soft Control in Risk Management," *Kiken to Kanri (Risk and Insurance Management)*, Vol. 42, planned to be published in March 2011.

[6] Kazuo Ueda (2009) "Corporate Ethics and Risk Management: Desirable Ways for Effective Ethical Risk Management," *Kiken to Kanri (Risk and Insurance Management)*, Vol. 40, Japan Risk Management Society, JARM Report No. 28, pp. 14-27.

[7] Tadao Kagono, Nobuyuki Isagawa and Norihisa Yoshimura (2010) *Corporate Governance Management: A New Paradigm for Corporate Governance*, Yuhikaku Publishing Co., Ltd., pp.298-305.

[8] The paper was written by an author based on the State of Michigan Office of Financial Management, "Internal Control Evaluation: Soft Control Self-Study," pp. 1-17; and Shoji Yamamoto (2006) "How to Consider Internal Control (7)," *Dai-ichi Life Research Institute Report*.

2-(2) Soft Control for Effective Implementation of Ethical Risk Management

I have already discussed methods and approaches for effective management of ethical risks caused not only by illegal corporate actions but also by problematic corporate actions in terms of fairness, honesty and responsibility considering handlings of stakeholders by the corporations in the past *Review*[9]. Let me restate the main discussion content below.

Ethical RM approaches include the ones which focus on reinforcement of control through laws, industrial and internal standards against illegal corporate actions (hereinafter referred as "compliance strategy") and also those based on corporate honesty and shared values (clarifying organizational objectives and values for promotion of commitment by employees), (hereinafter referred as "integrity strategy"). For example, Lynn Sharp Paine (1994) compared the effectiveness of these approaches in her thesis in 1994; described her opinions in deciding whether an ethical RM program should be based on "reinforcement of compliance" or "honesty and values" (clarifying organizational objectives and values for promotion of commitment by employees); and verified the differences and effectiveness of these programs (see Chart 4). She concluded that "an integrity strategy is an effective approach which can penetrate throughout the organization to create ethical culture[10]."

	1) Compliance Strategy	2) Integrity Strategy
Ethos	Conformity with externally imposed standards	Self-governance according to chosen standards
Objectives	Prevent criminal misconduct	Enable responsible conduct
Leadership	Lawyer driven	Management driven
Activities	Develop compliance standards, train and communicate, handle reports of misconduct, conduct investigations, oversee compliance audits; etc.	Lead development of company values and standards, train and communicate, integrate into company systems, provide guidance and consultation, assess values performance, identify and resolve problems, oversee compliance activities, etc.

Chart 4: Differences and Effects in Compliance and Integrity Strategies

Reference: This chart was created by the author, based on an article by Lynn Sharp Paine, "Managing for Organizational Integrity," Harvard Business Review, March-April, 1994, p. 113.

These studies indicate that it is more effective for ethical RM programs to proceed with integrity strategies than compliance strategies. As Chart 4 suggests, ethos, objectives and activities of compliance strategies require the entire process from development of compliance standards to audits to be thoroughly controlled in accordance with laws. On the other hand,

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[9] See Note 6.

[10] Lynn Sharp Paine, "Managing for Organizational Integrity," *Harvard Business Review*, March-April 1994, pp.106-117.

regarding integrity strategies, responsible actions are basically independently determined and flexibly controlled in various ways, such as through corporate values, educations, communications and consultations.

In summary, these studies concluded: "Humans who are origins of corporate activities may engage in misconduct due to some causes and factors no matter how their actions are constricted by laws. Therefore, ethical RM programs should rather focus on humans to develop regulations, ethical values and corporate cultures for prevention of misconduct engaged by corporate top management and employees."

Incidentally, the report by the State of Michigan defines a method of control which emphasizes corporate honesty, ethical values and relationships with stakeholders as "soft control[11];" while the State considers "hard control" as tangible and visible control by systems, processes, procedures, regulations, manuals and checklists. As far as I know, the State of Michigan is probably the only and first authority which used and defined the term, "soft control." Otherwise, I have found that the two approaches, which are referred to as "compliance strategies" and "integrity strategies," are similar to the concepts of "hard control" and "soft control," respectively.

Chart 5 shows a comparison of characteristics of hard and soft control for ethical risk control. This comparison displays great similarity to the aforesaid concepts of compliance and integrity strategies.

	1) Hard Control	2) Soft Control
Focus	Manuals, checklists, regulations, processes, procedures, written consents, approval documents, verification, etc.	Intangible assets, such as honesty, ethical values, leadership, management philosophy, relationship building, etc.
Characteristics	Tangible, objective, easy to verify	Intangible, subjective, difficult to verify
Example	Written procedures related to the code of ethics	Methods to verify compliance of employees with the code of ethics and procedures
Relationship with internal control	Control activities based on policies and procedures for appropriate implementation of orders and guidance by managements	Subjective elements of "honesty and ethical values" and "intentions and attitudes of managements" inside of controlled (internal) environment, that are impossible to be documented.

Chart 5: Hard and Soft Control for Ethical Risk Control

Reference: The author created this chart based on the materials created by the State of Michigan Office of Financial Management, "Internal Control Evaluation: Soft Control Self-Study," pp.1-17; and by Shoji Yamamoto (2006) "How to Consider Internal Control (7)," Dai-ichi Life Research Institute Report.

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[11] The State of Michigan Office of Financial Management, "Internal Control Evaluation: Soft Control Self-Study," pp.1-17.

2-(3) Soft Control in Terms of Internal Control

The concept of soft control described by the State of Michigan overlaps with the factors which COSO (the Committee of Sponsoring Organization of the Treadway Commission) puts emphasis on "control environment," within an internal control framework proposed in 1992, and also in "internal environment" within an integrated framework of COSOERM proposed in 2004. In conclusion, this is an approach which prioritizes ethical values, honesty, corporate cultures exercised by corporate top management in internal control of their corporations. Considering causes and backgrounds of recent corporate misconducts, we should give more efforts to advocate this approach and these factors in the future.

The importance of soft control in internal control was claimed not only in the United States but also in Japan. Tadao Kagono and Norihisa Yoshimura considered two methods for organizational control: "Hard control" which is a reward-and-punishment system based on levels of compliance with set rules; and "soft control" which depends on people's feelings of loyalty or sense of ethics[12]. They also described, "Organizations which have to depend on adjustment methods through feedback (Note: This adjustment depends on communications with people who need to be adjusted) have no means but to depend on soft control because they cannot determine operational procedures and rules in advance and also because their operations cannot be efficient. They need to combine various means, such as recruitment methods, education and training, and personnel systems, to enable soft control. Since there is a limit for both soft and hard control, both methods are applied in combination in many cases[13]."

In addition, Kagono and Yoshimura indicated the following reasons to explain the limitation of the Financial Instruments and Exchange Act commenced in 2007 which is considered to be hard control[14]:

(1) Limited effects against enormous costs (Note: Dependence on hard control makes difficult to prevent misconducts.)

(2) Possibility to become useless in Japan in which soft control works well.

(3) Tendency to provide an environment conducive to bureaucratic operations of organizations (an environment which has little change and no issue with awaiting customers contributes to efficiency in bureaucratic operational procedures because every decision is made in accordance with rules)

(4) Possibility to weaken the strength of Japanese companies through continuous improvement of rules applying suggestion systems.

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12 Kagono, Isagawa and Yoshimura (2010), op. cit., pp. 299.
13 Kagono, Isagawa and Yoshimura (2010), op. cit., pp. 300.
14 Kagono, Isagawa and Yoshimura (2010), op. cit., pp. 300-305.

2-(4) Other Fields Related to the Study of Soft Control

(1) Soft Law

In the science of law, there are studies which focus on a concept, "soft law," which relates to "soft control." This term contrasts with the term, "hard law," which means various norms which can be enforced by courts. On the other hand, courts cannot enforce compliance with soft laws which are ethical and social norms[15]. Law is one of priority matters which corporations should follow, but is not sufficient to support communications with various stakeholders. This is why ethical and social norms should be emphasized in soft law. Kazuhiko Takano suggested the following in the 40th volume of *Kiken to Kanri*: "The stronger the social influence of a corporation becomes with a strong performance, the higher the level of norms for a corporation to be compliant. These 'high norms' are, of course, needed to be imposed in addition to applied law applying disciplinary rules and norms by each corporation. These voluntary additions are considered to be soft law[16]." It is needless to say that these approaches greatly relate to soft control emphasized in this paper.

(2) Soft Power

Joseph S. Nye, who specializes in security affairs, introduced a concept of "soft power" in his book which I would like to quote as follows:

Nye described, "In reality, hard power is represented by police force, economic power, and authority over personnel affairs, which are applied for coercion to influence other people's behaviour. Hard power is based on the ability to use carrots (payments) and sticks (threats). However, it is also possible to make others follow your will without threats or payments by giving chances for negotiation. If you can get others to be attracted to you, you can get what you want. This is what I called soft power, which is not the ability to manipulate others with material incentives but the ability to attract others to get what you want. Instead of intimidating others, you persuade others to become your friends. …… In the business world, every good manager knows that it is important for leadership to not just give orders but also show examples and persuade others to follow your will. It is hard to lead large organizations simply by giving orders. A business specialist suggested, 'Managers cannot manage everything. …… Staff members cannot be led by rules and instructions by a single manager but often by their corporate culture – commonly learned organizational values[17]."

It is common in the concepts of soft law and soft power to take voluntary methods rather than coercive methods, and to emphasize on intangible assets, such as ethical values, norms,

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[15] Hideki Kanda, "Development of Examples related to Corporate Social Responsibility," *Soft Law no Kiso Riron* (Basic Theory of Soft Law), representative ed. Nobuhiro Nakayama, ed. Tomotaka Fujita (2008), pp. 153.

[16] Kazuhiko Takano (2009) "Corporate ethics and CSR in Corporate Law," *Kiken to Kanri*, Vol. 40, pp. 41.

[17] Joseph S Nye Jr. (2008), *The Powers to Lead*, Oxford University Press, (Japanese version title) *Leader Power-21 Seiki Gata no Shudousha no Tameni*, translated by Itaru Kitazawa (2008), Nihon Keizai Shinbunsha, pp. 51-52.

communication and trust rather than on rules and manuals. Actually, although I discussed in the previous chapter about soft control that hard and soft control should be applied in combination, these soft approaches which have been disregarded should be primarily emphasized for fostering of the concept in order to subsequently discuss how to combine them with hard approaches.

Therefore, soft control in the fields of RM and internal control and soft law in the field of law and soft power in security affairs are the concepts which accord with the core concept of social capital in the fields of sociology, public policy and macro economy: "An approach to increase efficiency of societies, organizations and corporations by trying to emphasize and foster trust, bond and confidence in person-to-person relationships and networks."

3. Importance of Soft Control and Social Capital for Disaster Risk Management
As I described the characteristics and backgrounds of disaster risks in Chapter 1, it is important to take the following measures against disaster risks: (1) Minimize casualties (deaths and injuries) immediately after a disaster; (2) psychological recovery of the victims; (3) sharing of risk information on a daily basis; and (4) implement measures against vulnerability of cities and communities by the local and national administrations. Considering these points, I would like to firstly indicate an overall framework for RM for my discussion of effective management for disaster risks.

Earthquaku risk
- Risk finance
  - Earthquake insurance/mutual aid
  - Financial support system
- Risk control
  - Hard control
    - Various disaster prevention/reduction measures
    - Manuals
    - Plans to continue operations (for corporations)
  - Soft control
    - RM power improvement against disaster risks by fosteriing a feeling of trust/bonds/networks
    - Share risk information (education of disaster prevention and safety)
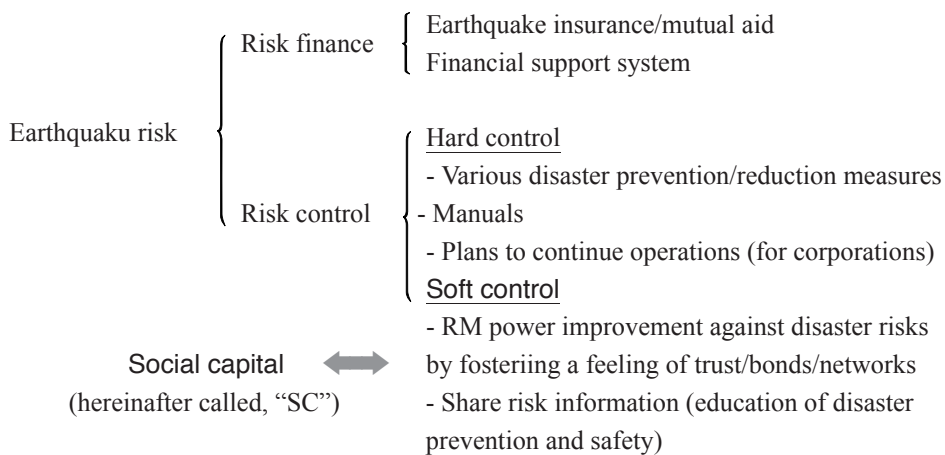
Social capital (hereinafter called, "SC") ⟷

Chart 6: Relationship of Disaster RM System, Soft Control and Social Capital

As described in Chapter 1, there are two measures against earthquake risks: Risk finance to financial recovery after a disaster and risk control (RC) to prevent disasters and minimize human and economic losses due to a disaster. RC includes "hard control" through various disaster prevention/mitigation measures (e.g. seismic isolation designs and fall prevention) by focusing on manuals, guidelines and plans; and "soft control" through further improvement of

RM power against disaster risks and a feeling of trust by focusing on development of trust relationships between residents and between residents and the administration, bonds of residents and networks between related parties, and sharing risk information between related parties.

In this RM framework, it is important, as described, to take the following measures against disaster risks: (1) Minimize casualties (deaths and injuries) immediately after a disaster; (2) psychological recovery of the victims; (3) sharing of risk information on a daily basis; and (4) implement measures against vulnerability of cities and communities by the local and national administrations. I would like to discuss relationships between each of these factors and soft control and social capital below.

(1) As to the minimization of casualties (deaths and injuries) immediately after a disaster. If buildings are collapsed due to an earthquake, trapping people underneath and they cannot get out by themselves, it is important that neighbours voluntarily help each other as quickly as possible. In the case of Kobe Earthquake in January, 1995, 100,000 wooden houses totally collapsed. Immediately after the earthquake, about 35,000 people became buried alive underneath the collapsed buildings, but the next day, about 27,000 of them were rescued by efforts of the neighbours.

Of the death toll due to the Great East Japan Earthquake of 2011, victims aged over 60 years old accounted for 65.2%. 92.5% is said to be by drowning. What caused such a number of victims? To discuss this question, I think that not only hard factors like seawalls and the level of magnitude but also soft factors like preparedness, risk sensitivity, training, and risk information (to be shared by community members, entrepreneurs and governmental agencies) should be taken in to account. I will deal with details of these topics in the next issue of this Journal.

It is important to know how to survive by yourself (self-help) and rescue other victims immediately after a disaster. For this purpose, mutual cooperation between neighbours on site (self-help) in the earliest stage is critical before emphasizing cooperation between neighbourhood and municipalities (mutual aid) followed by public aid by the government or municipalities[18]. Here, I would like to focus on self-help as initial action and the importance of mutual cooperation between neighbours.

Kawata described, "It is basic for disaster risk management to deliver self-help, mutual aid (communities unite to secure safety) and public aid (obligation of the government and municipalities). In Japan, the level of importance of these support systems tends to be misunderstood in a ratio of 1:2:7, respectively, before a disaster. Once a disaster occurs, people cannot avoid realizing that this ratio must be reversed to 7:2:1, resulting in confusion immediately after a disaster.[19]"

I consider that daily face-to-face interactions between neighbours are the minimal

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[18] Yoshiaki Kawata (2008), *Korekara no Bousai/Gensai ga Wakaru Hon* (Future Disaster Prevention and Mitigation), Iwanami Junior Shinsho, pp. 124.
[19] Kawata (2008), op. cit., pp. 115 and pp. 223.

condition to develop a feeling of trust, bounds and networks between neighbours which enable self-help and mutual aid. For minimization of losses and quick recovery after a disaster, it is necessary to utilize existing social capital and soft control. Based on such mutual trust, repeated emergency drills could become effective.

The groups which were developed among protesters against industrial pollution in the 1960's contributed to develop groups again immediately after the occurrence of Kobe Earthquake in 1995. It was reported that these groups played a great role for recovery of the disaster area by promptly helping evacuation to schools, development of kitchen areas which could be shared by the community members, and provision of surveillance against depredations[20]. Their activities are an example of utilization of existing social capital for mitigation of disaster risks.

(2) With regard to the recovery of property losses due to a disaster, earthquake insurance could be a measure to be taken because it is important to recover damage to buildings. On average, 20.1% of the households in Japan have earthquake insurance, including 27.9% in Tokyo and 26.6% in Kanagawa. These percentages are still low, although they became higher after the Kobe (Hanshin-Awaji) Earthquake in 1995. The total amount of insurance payment in relation to the Kobe Earthquake was around 78.3 billion yen. But, as for the Great East Japan Earthquake in 2011, the figure could amount to 1.6 trillion yen, which is about 20 times of the sum of the Kobe Earthquake. Moreover, considering payments of earthquake insurance claims, I found a variation in levels of financial benefits depending on cases related to insured conditions and amounts, and amounts of losses.

However, the following research result (Chart 7) on "burdens of the victims five years after the Kobe Earthquake," containing 1,623 items of burdens in total, indicated that 489 items were related to "housing reconstruction" which was the highest percentage of 30.1%. Originally, insurance systems are limited against enormous risks such as earthquake risks. Nevertheless, this is the most difficult area in insurance systems which might require special cooperation with the administration and authorities concerned for recovery of building damage. This issue relates to risk finance discussed in Chapter 6.

(3) The research result in Chart 7 clarifies the importance of psychological recovery of the victims. In other words, neglect of local communities in providing temporary housings forced the victims to develop new human relationships (connection)[21]. This was a very heavy burden on their shoulders, so that the second heaviest burden was related to this issue, including 407 items which were 25.1% in total. Hence, the heaviest burden was about "housing" issues related to temporary housings and the second heaviest burden was about "connection" issues related to residing in the temporary housings. As Kawata described, "a thoughtful consideration" is needed "for temporary housing residents to maintain human relationships in their local

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[20] Howard K. Koh, Rebecca O. Cadigan (2008), "Disaster Preparedness and Social Capital," Ichiro Kawachi, S.V. Subramanian, Daniel Kim ed., (2008), *Social Capital and Health*, Springer, pp. 275.
[21] Kawata (2008), op. cit., pp. 26.

communities[22]."

    There are also mental problems after the disaster, especially among children. According to a sample research (*The Nikkei* newspaper, 25 April, 2011), 33% of the parents have felt that the Great East Japan Earthquake affected somehow the mental state of their children.

    These issues should be also included in the discussion of soft control and social capital which emphasizes person-to-person bonds, a feeling of trust and networks, as explained in Chart 6.
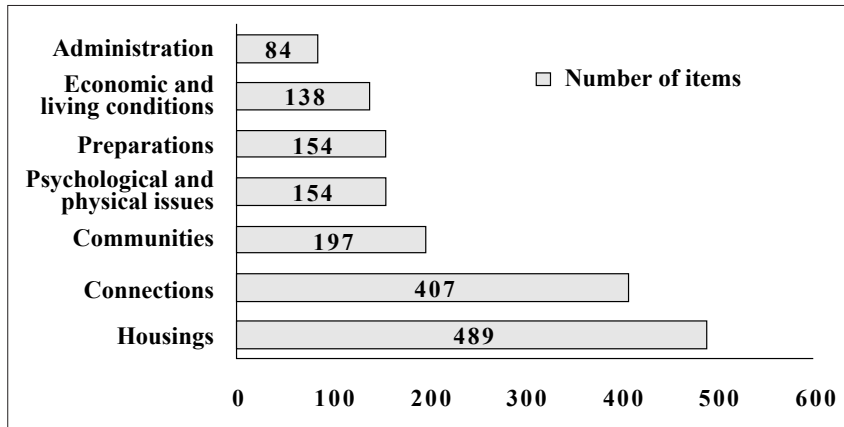

Chart 7: Result of a Research on "Burdens of the Victims Five Years after the Kobe Earthquake" (Kobe City) (Total number of items: 1,623)
Reference : Yoshiaki Kawata (2008), *Korekara no Bousai/Gensai ga Wakaru Hon* (Future Disaster Prevention and Mitigation), Iwanami Junior Shinsho, pp. 26.
Note : This original chart was partially modified.

    (4) RM considers the issue of disaster risk sharing as part of risk communication. The term, "communication," is derived from a Latin word, "communis," which means "sharing." Therefore, "risk communication" means risk information sharing. This concept emphasizes sharing correct information of disaster risks between the experienced (victims) and the unexperienced. The information should be transmitted from the victims to the unexperienced and the administration. The administration, then, should make sure to transmit the received information in an understandable, precise and prompt way and make everyone understand it.

    In sharing risk information, we should not neglect a notion[23] in which social trust between the senders and the receivers is an important factor which affects effectiveness in risk communication, in addition to preciseness in the message content of risk information. In other words, the senders and the receivers of risk information should develop a trust relationship for

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22 Kawata (2008), op. cit., pp. 26.
23 George Cvetkovich & Ragnar E Lofstedt ed., (1999), *Social Trust and the Management of Risk*, Earthscan Publication, pp 2.

effective risk communication. This notion also relates to the discussion of soft control and social capital which emphasizes person-to-person bonds, a feeling of trust and networks.

Regarding sharing disaster risks, I think that it is important for Japan, where disasters frequently occur, to share information in high schools and universities. I personally consider that high schools and universities should deal with the overall RM information for various RM from personal levels to community levels, since various risks in addition to disaster risks could affect our lives and activities. At least, students should be educated on how to manage risks in their lives and also in their communities. Kansai University introduced this concept of RM education against various risks for information sharing in the university level of education, launching a new faculty called, "Safety Science," in April, 2010. This new faculty studies approaches which consider not only disaster risks but also various risks in a way that I claimed. Maiko High School in Hyogo Prefecture, where the Kobe Earthquake occurred, commits to disaster risk information sharing. This high school became the first school to offer the environment and disaster mitigation course for disaster education activities. The educational policies and course curriculums are explained below. They provide a great reference for disaster RM. The following information is related to their educational philosophy and the course curriculums were obtained from the school's website.
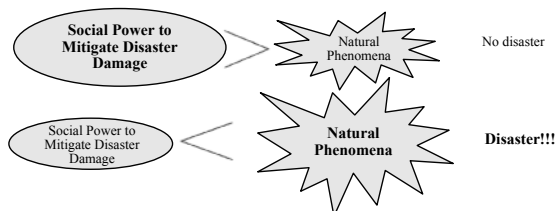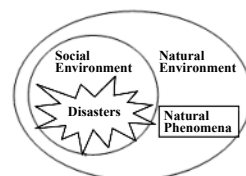
Maiko High School has sent 18 students to Ishinomaki city as volunteers after the Great East Japan Earthquake. In the near future, all the students of the environment and disaster mitigation course will visit Miyagi Prefecture in turn for their volunteer activities.

The environment and disaster mitigation course has these three points in its basic educational philosophy:

- The disaster mitigation education is based on the lessons of the Great Hanshin-Awaji Disaster. It also makes the students think about the importance of life, cultivates the students' power against disasters, and fosters the development of human beings who can contribute to society.

- We cooperate with universities, research institutes and coherent organizations. Students' understanding of the environment and disaster mitigation is deepened through experience learning. We aim to foster individuals who can take actions independently to solve various problems related to the environment and disaster mitigation.

- The students are expected to understand deeply about the various environments (natural and social) by learning the mechanism of the natural phenomenon and the relationship between disasters and human society. One of the main goals is to raise the students' attitude to "Think Globally, Act Locally."

The environment and disaster mitigation course curriculum considers natural and social environments. Typhoons in the middle of Pacific Ocean or earthquakes in the areas without habitation are considered not as disasters but as natural phenomena. Natural phenomena could become disasters when they affect human societies and cause damage. Roughly speaking, the scale of a disaster is measured in comparison between the magnitude of the natural phenomenon and the level of social power to mitigate the damages. Although a strong earthquake occurs, if the society has an organized mitigation system, the damage could be minimized. If the society with weak mitigation power as seen in developing countries, a strong earthquake could damage the area to a serious degree. We can clearly understand this correlation in damages caused by the recent series of earthquakes in developing countries. Hence, social environment deeply relates to disaster mitigation power that requires us to learn the social environment and think how to mitigate disaster risks (disaster mitigation). This educational curriculum was developed based on two focuses: A vertical axis for education of the value of life and importance of mutual aid, which are the core themes of new disaster mitigation; and a horizontal axis for education of natural and social environments.

List of Special Subjects		
Level	**Required**	**Selective**
1	-Disasters & Human Beings -Environment and Science -Disaster Mitigation Information	
2	-Social Environment & Disaster Mitigation -Natural Environment & Disaster Mitigation -Activity in Disaster Mitigation -Human Beings & Society	-Environment and Disaster Mitigation Literature Study
3	Graduation Report -Social Environment & Disaster Mitigation -Natural Environment & Disaster Mitigation -Activity in Disaster Mitigation	-Disaster Mitigation Information -Disaster Mitigation Workshop

Reference：Website of Maiko High School in Hyogo Prefecture (Partial)

URL：http://www.hyogo-c.ed.jp/~maiko-hs/ (Assessed in January, 2011)

(5) Measures of the administration and the government against vulnerability of cities and communities

As I discussed in the section on the RM framework, hard control is necessary but insufficient for overcoming vulnerability (degrees of fragility against impacts) of individuals, communities and cities against disaster risks, and also for improvement of recovery power (recover the original economic and psychological state).

Kamaishi city had a seawall which had been completed in 2009 at the cost of 121.5 billion yen. This is thought to be a typical hard prevention tool. Unfortunately, however, the tsunami on March 11, 2011 got over this huge seawall and killed 1,300 people. There is a limit with hard prevention tools. Therefore, soft control should have vital importance. Accurate information of tsunamis, of safe places, evacuation drills, flexible ways of evacuation, etc. all do matter. Actually, about 3,000 pupils and students of elementary and junior high schools in the Unosumai area of Kamaishi city have all survived thanks to evacuation drills and their own quick judgements. They were able to make the right judgement that the designated evacuation place might be in danger, and to have a flexible thinking that they should evacuate beyond the boundaries of the hazard map.

Soft control and social capital discussed in this paper should be emphasized as the main concepts to be fostered for development of countermeasures. This is the so-called, "soft approach," which focuses on fostering of trust and bonds. It is an important element for development of cultures which are strong enough to survive through disasters and deal with disaster risks. Strong cultures against disaster risks have a set of behavioural manners and values which allows communities to collectively and voluntarily select their optimal approaches against disaster risks.

Fostering of soft control and social capital includes an important element for development of strong communities against disasters: It is necessary to have leadership which actively manages disaster risks in communities and the administration. This element was also emphasized in a lecture by one of the two professors, Professor Matt Allen from Wollongong University in Australia for a public program held by the Center of Social Capital Studies of Senshu University in September, 2010, titled, "Roles of Social Capital in Disaster Recovery – Cases in Australia and Japan –." He presented a case study of Cyclone Larry[24] which compared three affected areas in the State of Queensland and analysed social capital in dealing with disasters. He especially highlighted that he found no leadership in the Babinda region which was affected the worst.

The details of this public program in September, 2010, have been published in the "Annual

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[24] Cyclone Larry is a severe cyclone which made landfall in the State of Queensland in March, 2006 (highest winds recoded as 300km per hour) and affected a vast area of 12,500 km2. The total amount of losses excesses about a billion dollars. Professor Matt Allen introduced actually experienced cases in this disaster and indicated several meaningful notions. The details of the lectures by Professor Allen and Professor Simon Ville will be published by the Center of Social Capital Studies of Senshu University in 2011.

Report" (March, 2011) of the Center of Social Capital Studies of Senshu University. The main points of the discussion over "how people exercised leadership", raised by Professor Allen, himself a victim of the cyclone, and Professor Jun Oyane from Senshu University, are as follows.

- Case of Cyclone Larry in Australia (explained by Professor Allen):

In the countryside, leadership was taken by the residents who were born and raised in the area (agricultural business owners), those victims who had previous disaster experience and some women. However, no senior citizens older than 50 years old or young people took leadership.

- Case of Kobe Earthquake (explained by Professor Oyane):

Leadership was taken by a group of boy scouts, young volunteers who gathered after the disaster, elementary school principals and PTA organizations.

Extraordinary (massive) risks, even more so than daily risks, often require levels of action that are not covered in conventional behavioural manuals or procedures. This is the limitation of hard control indicated in this paper. Soft control and soft power can increase social power to handle such disasters. The people who experienced the risks can understand the situation in a correct way. Therefore, knowledge obtained from disaster experiences can help to deepen our understanding of the situations which have never been explained in conventional manuals or procedures. Moreover, considering the concrete level of handling disasters, I assume that experienced authority figures could easily gain consent from many people in implementing countermeasures. It is important to share disaster risk information among many parties concerned in addition to the residents under leadership. This issue relates to the aforementioned issue of risk information sharing.

Soft control and social capital emphasized in this paper should be the core concepts which foster strong cultures against risks incurred by enormous disasters. It is clear from characteristics in occurrences of enormous risks of enormous disasters that we do not usually realize the hidden risks but could become the victims of the large losses when least expected. Disaster risks are not only natural problems (e.g. global warming → heavy rainfall → flooding) but also social problems because they amplify the damages[25] (inadequate data, densely populated coast areas, unreasonable urban development and abandoned cultivation). Therefore, a consistent risk management process should be started before any occurrence of disaster risks, by assessing and determining the situations based on purposes for local development, external environment, local cultures and resources (humans, technologies and processes), and values of the parties concerned. And then, various local risks including disaster risks must be assessed and handled. This process allows local residents and parties concerned to develop a feeling of trust, bonds and value sharing, and will foster strong cultures against disaster risks.

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[25] Kawata (2008), op. cit., pp. 28-31.

Conclusion

Analyses and discussions in this paper clarified the following points. I would like to list them below as conclusions:

1. Disaster risk indices of Japan, especially of the large cities, have reached the world's worst level indicating that Japan's vulnerability is especially a problem. It is extremely important for Japan to manage risks which are hidden or rare, but possible to cause large losses and amplify damage, not only for natural problems but also social problems. The residents also primarily hope to have a safe society.

2. Disaster risks are imposed throughout the society so that it is highly inefficient to handle risks only by each economic body. It is important to handle risks by self-help and mutual aid immediately after a disaster as a basis, followed by public aid from the administration and other appropriate bodies after the disaster.

   There are two approaches in disaster RM: Risk finance and risk control. Risk control plays a significant role in lifesaving of the victims and fostering of strong cultures against economic and psychological damage and disaster risks. Especially, as this paper indicated, soft control and the similar concept of soft power, in addition to the concept of social capital and handlings based on these concepts, are effective in disaster RM.

3. In a concrete sense, lifesaving of the victims immediately after a disaster is heavily dependent on prompt self-help, and handling disaster risks through mutual aid is heavily dependent on social capital of the community. Daily efforts to maintain human relationships for development of a feeling of trust and bonds can be a strong countermeasure not only against psychological vulnerability but also against disaster risks.

4. One of countermeasures against economic losses including "housing" for the victims could be to have insurance policies as risk finance. However, the level of coverage is not high due to the content, situation and exclusion of current insurance systems. In a social perspective, it is important to implement various countermeasures as provision of some sort of public aid which could substitute insurance systems or cooperation from private insurance companies.

5. Disaster victims suffer greatly not only from economic problems with "housing" but also from other problems in a psychological and emotional level, such as "connections" and "feelings." In provision of public aid (e.g. temporary housings), it is also important to care for these aspects. This viewpoint can also be derived from application of soft control and understanding of social capital.

6. A requirement in disaster risk information sharing to consider accuracy, promptness and comprehension. In addition, the level of understanding and sharing of information depends on the level of trust between the sender and the receiver on a daily basis. In other words, improvement in the level of trust between the sender and the receiver of disaster risk information presupposes fostering a feeling of trust through activities to

share experiences in implementing various methods and approaches on a daily basis, for sharing not only risk information but also various information. In this sense, it is also important to apply soft control and understand social capital because these concepts focus on fostering a feeling of trust.

7. Education plays a significant role in risk information sharing. Risk and safety education tends to be avoided. But, this attitude is not based on realism. As this paper indicated, some high schools and universities have already started education for risk information sharing.

8. Fostering of strong cultures against disasters and risks means to make every member of the community hold a set of behaviour patterns and values which allow them to select optimal methods in a voluntary way. In order to realize this, it is necessary to share risk information and feel trust in addition to have leadership based on disaster experiences especially after a disaster. Hence, soft power as a similar method as soft control could also be effective in this case.

9. Disaster risks are not only natural problems, but also social problems because they amplify the damages. Therefore, a consistent risk management process should be started before any occurrence of disaster risks by "assessing and determining the situations" based on purposes for local development, external environment, local cultures and resources (humans, technologies and processes), and values of the parties concerned. And then, various local risks including disaster risks must be assessed and handled. Although it is important to have leadership, it is necessary to have some sort of RM process against unexpected enormous risks by starting "assessment and determination of the situations." This process allows local residents and parties concerned to develop a feeling of trust, bonds and value sharing and will foster strong cultures against disaster risks.