

**Adaptation and Implementation of the Yonmenkaigi
System Method for Disaster Reduction-oriented
Collaborative Action Plan Development
at the Community Level:
Case Studies from Japan and Indonesia**

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Chapter 1 Introduction

1.1 Background

Japan has gained valuable lessons from the 1995 Great Hanshin Earthquake disaster and other large disasters that subsequently occurred one after another across the whole country and in other parts of the globe. Accordingly, Japan's disaster planning and management paradigm was forced to shift. Table 1.1 compares the conventional 20th-century approach with the new directions that the 21st-century approach is required to take (Okada, 2004). Notably, one of the challenges is to make a greater shift from a top-down to a bottom-up approach. A significant lesson about low-frequency/high-impact disasters was learned from the Great Hanshin Earthquake disaster. This type of disaster shows that local residents, victimized by such a huge disaster, may not be able to immediately depend on local government to rapidly set up local headquarters to direct emergency and crisis management, in order to engage in relief and rescue activities as quickly as possible.

After the Great Hanshin Earthquake disaster, governments in Japan learned about their limitation to provide relief at the local community in the first hours after a major disaster. Thus, the governments in Japan recognized the need of local community's role as well as each household individual to be better prepared. Therefore, the enhancement of disaster coping capacity and preparedness at the community level is crucial. Thus, in the 2008 Disaster Prevention White Paper, the Government of Japan put the emphasis on the roles of local communities, community-self-reliance (*kyojo* in Japanese), as well as on household/individual self-reliance (*jijo*)(Government of Japan, 2008)).

Table 1.1 Conventional disaster planning compared to 21st-century integrated disaster planning and management*

<i>Conventional Disaster Planning</i>	<i>21st-century Integrated Disaster Planning and Management</i>
Reactive	More proactive
Emergency and crisis management	A more risk mitigation and preparedness approach
Manual-based countermeasure approach	A more anticipatory/precautionary approach
Predetermined planning (no-surprise)	A more comprehensive policy-bundle approach
Sectoral countermeasure approach	A more adaptive management approach
Top-down approach	A more bottom-up approach

*Based on Okada (2006)

As a result, local, regional, and national governments in Japan are now promoting the enhancement of coping capacity and preparedness in local communities instead of trying to guarantee the management of disasters mainly by the governments themselves as responsible administrative bodies that inevitably tend to emphasize the need for top-down command control. For these reasons,

local residents who live in disaster-prone areas are now encouraged to become a disaster-resilient community by improving disaster preparedness and mitigation as soon as possible.

The new challenge for local communities is how to increase awareness of the need for disaster risk reduction, and how to develop an executable action plan with appropriate external support provided from the local, municipal, and/or regional governments as well as from the results of ongoing research endeavours by academia. Equally important is the scientific leverage required to support efforts to enhance a community's self-reliance capacity. In Japan, after the 1995 Great Hanshin Earthquake, participatory workshops for the improvement of local disaster reduction capacity have been initiated to provide disaster education in communities.

1.2 Why are participatory workshop methods needed and important to improve capacity for disaster risk reduction in local communities?

Participatory workshop approaches are used in situations where a number of people should work together to resolve a common problem. Successful problem solving demands input from a variety of people with many types of experience and knowledge. It also includes everyone who is interested in finding the best solution – the “stakeholders”. Experience shows that when everyone contributes to the learning process, then people feel more ownership of the problem and develop more appropriate solutions for their context (the Alliance, 2001). Disaster reduction is an issue that often involves the whole community in Japan. It requires that people from local government, local community, residents, and NGOs work together. Participatory workshops can be very effective in bringing people together, from members of local communities to NGOs and local organizations. When people at local government, local community, residents, and NGOs have the opportunity to learn and to work together collaboratively, there can be better co-ordination of activities. The workshops for disaster reduction can raise risk awareness of disasters, as well as develop knowledge, skills and attitudes related to disaster reduction.

The participatory workshop method presented here, developed for community-based disaster reduction, is considered useful. However, it is not yet completely clear whether such commonly used methods adequately serve the purpose and if so, how effective they are and how, specifically, they should be used. This research is based on the premise that community-based action plans can only become literally actionable, and therefore executable, if action plans drafted by local residents are collaboratively developed and executed together. If local residents collaboratively create an action plan for disaster reduction in their local community level, commitment to implement the plan by local residents is significantly improved.

Workshop methods in disaster reduction have helped to improve risk awareness for disaster in Japan. The participants acquire knowledge about hazards and disaster reduction, express their own opinions and hear opinions of other participants about disasters through workshops. Participants could have a new interest concerning hazards and disaster reduction that they did not have until now. Expansion of such interest could lead to implementation of disaster reduction activities in the future. Participatory approaches to learning are active approaches that encourage people to think for themselves.

In order to reduce disaster impacts at the local community level, collaborative action is necessary as shown above. Risk awareness should lead to implementable actions to improve the capacity of a local community in disaster situations. Workshop methods can be used to develop more effective action plans at the community level that include collaborative decision-making techniques among residents for proactive disaster management. In this study, a workshop method, called the Yonmenkaigi system method, has been proposed to create collaborative action plans for improving disaster reduction capacity in communities. The Yonmenkaigi system method was originally designed and used for collaborative action development for a small group in community-citizen vitalization initiatives called machizukuri in a mountainous municipality of Chizu Town, Tottori, Japan (Okada and Teratani, 2005).

The dissertation uses the Yonmenkaigi workshop method and adapts it to community reduction action planning. The Yonmenkaigi system has two main objectives. The first is to obtain knowledge that is linked to action from each participant. The second is to develop a collaborative action plan at the local community level so that participants are able to achieve more than enhanced risk awareness and to develop communication among the participants. Collaborative activities between residents and their community are an important and necessary element in improving disaster prevention activities in local communities.

Acknowledging the need to improve community resilience through better disaster reduction planning, this dissertation pursues the following three objectives:

- i) To evaluate the use of the Yonmenkaigi system method as a participatory workshop method for disaster reduction at the local community level.
- ii) To examine the Yonmenkaigi system method as a tool to develop collaborative action plans for disaster reduction at the community level.
- iii) To analyze the Yonmenkaigi system method as a means to promote knowledge development between multi-stakeholders and local communities.

1.3 The structure of the dissertation

This dissertation consists of 7 chapters as shown in Fig.1.

Chapter 1 introduces the background of this research including the research problem, objectives and the structure of the dissertation.

Chapter 2 gives the definition of participatory workshop methods and then reviews the current research workshop methods of Japan to improve risk awareness for disaster reduction in at the local community level. It is important to point out that participatory workshop methods for collaborative action development are currently not available. This is a missing area in the development and implementation of participatory workshop methods for disaster reduction. This chapter includes some problems of the current workshop methods.

Chapter 3 provides an explanation of the Yonmenkaigi system as a participatory workshop method. It includes a brief history, an overview, and the process of the Yonmenkaigi system, which has been designed and used for collaborative action development in community-citizen vitalization initiatives called *machizukuri* in a mountainous municipality of Chizu Town, Tottori, Japan (Okada and Teratani, 2005, Tatano and Kanda, 2008). Then the chapter focuses on the debating process of the Yonmenkaigi system as the multi-level knowledge development process between participants of a Yonmenkaigi workshop.

Chapter 4 carries out analysis on development of collaborative action plan between groups through a debating process as internal knowledge development between the participants of a Yonmenkaigi workshop in case study areas of a Jishubosai-soshiki (Self-governed Community Association for Disaster Reduction) of the Shuhachi community, Nakagyo Ward, City of Kyoto, Japan. The Interpretive Structural Modeling (ISM) method is adapted to identify the core action components of a collaborative action plan by revealing the relationships of action components.

Chapter 5 emphasizes the challenge of mutual knowledge development among the Yonmenkaigi workshop participants and external stakeholders through the adaptation of the Yonmenkaigi workshop to improve sand mining management for disaster reduction at the local community level in a case study of the Kemiren Village, Merapi Volcano of Indonesia. The model of mutual knowledge development between “seed knowledge providers” and “custom knowledge providers” are shown. The Yonmenkaigi workshop field results from Kemiren Village were described. The model of mutual knowledge development among multi-stakeholders is illustrated.

Chapter 6 introduces the Sandankai system. It presents the result of a case study that was carried out in the Samcheok High School, City of Samcheok, Gangwon Province, Korea. Then, the chapter

discusses the integration of the Sandankai system and the Yonmenkaigi system for integration of disaster risk management for both pre-disaster and post-disaster.

Chapter 7 summarizes the main contributions of this study and discusses policy implications as well as future research needs.

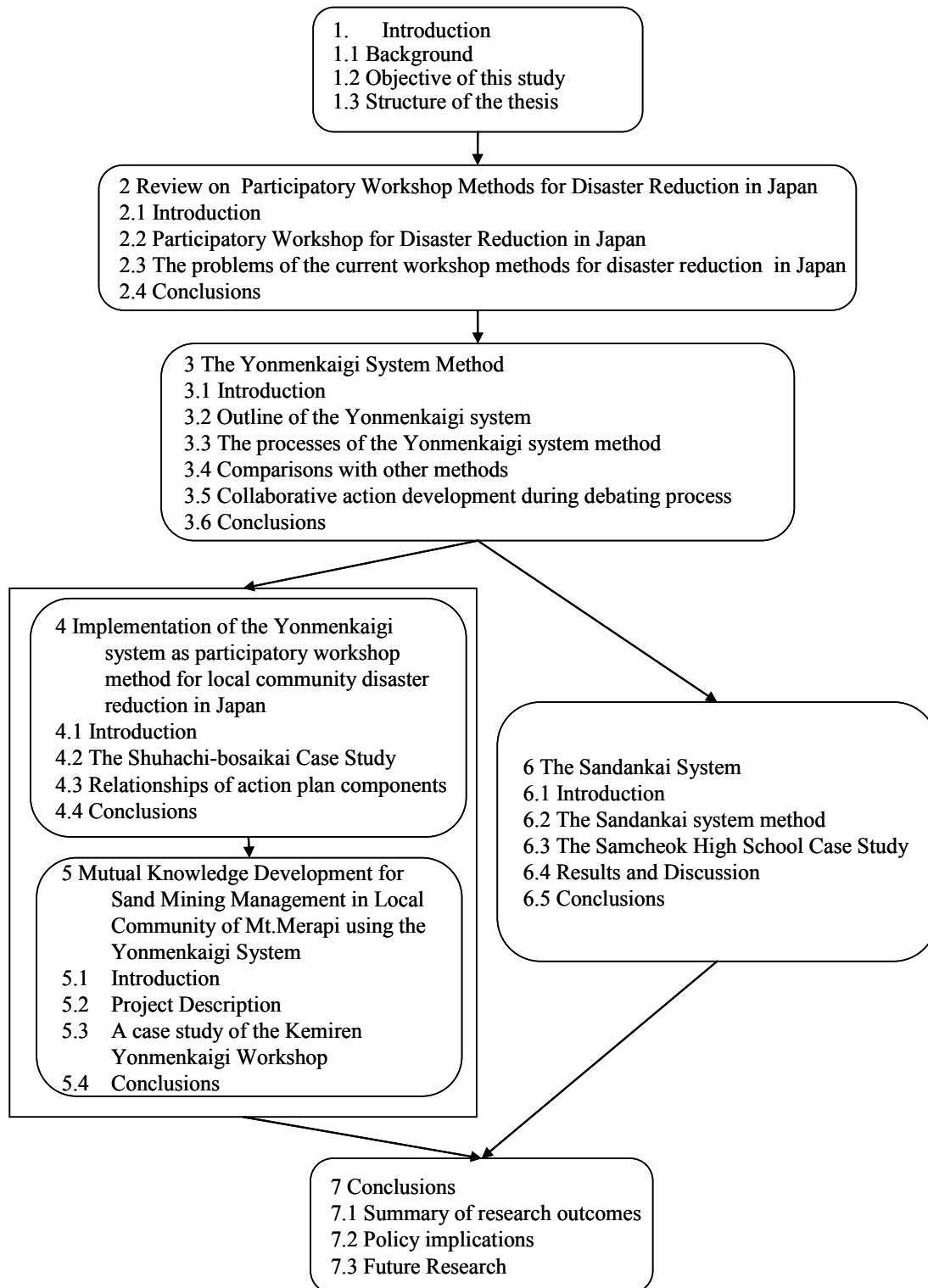


Figure 1.1 Structure of the dissertation

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Chapter 2 Review on Participatory Workshop Methods for Disaster

Reduction in Japan

2.1 Introduction

This chapter describes participatory workshops and the current workshop methods in Japan to improve risk awareness for disaster reduction. Then, the chapter discusses the problems of the current workshop methods in disaster reduction for local community in Japan. In the following sections, we define participatory workshop for disaster reduction at the local community level, and briefly introduce the three workshop methods that have been applied in community disaster reduction planning and management. It is important to point out that participatory workshop methods for collaborative action development are currently not available. This is an area missing in the development and implementation of participatory workshop methods for disaster prevention and mitigation. This chapter includes some problems of the current workshop methods.

In the case of Japan, local government already carried out disaster prevention activities for local communities. For example, practicing evacuation drills, providing information about hazard and disaster prevention to neighbourhood associations (*chonai* or *chonai-kai*), the smallest collective self-governing unit in Japan (Nitschke, 2003). However, these activities for disaster prevention in local community have problems. The first problem is that these events are carried out only once as a set format training that does not take into consideration the local context of the community for sustainable activities. The second problem is that local government provides only general information such as distributing hazard maps and guidebooks for personal actions for post-disaster. After these events, local government does not effectively share the feedback of the evacuation drill with the residents. When comparing these points, participatory workshops could propose a new communication approach between local government and local community. Participatory workshops are able to reflect in its structure the local context considering real situations of a local community by collaborative work.

2.2 Participatory Workshop for Disaster Reduction in Japan

Participatory workshop need to achieve more effective action plans at the community level that include collaborative decision-making techniques between residents and local communities for proactive disaster management. This dissertation suggests that the residents' participatory workshop method be used to develop action plans for disaster reduction activities created by the participants themselves at the local community level.

2.2.1 Definition of Participatory Workshop for Disaster Reduction in Japan

Workshops have been suggested as one participatory approach to discuss, analyze, and solve common problems among residents, local community, and local government (Sanoff, 2000) (Nakaya,1987) (K. Numa et al. 2008) (Kikkawa et al.,2004) (Komura, Hirano,1997) .

The *workshop* is defined in several ways:

A workshop is a period of discussion or practical work on a particular subject in which a group of people share their knowledge or experience (Collins Cobuild Advanced Learner's English Dictionary, 2009).

The term workshop means that citizens engage in experiences that provide an opportunity for learning about human relations. Learning is most functional when it grows out of personally involving experiences that require reflecting, developing, and testing of new insights and approaches to problem solving. Workshops are an effective means for achieving face-to-face interaction between citizens as they share in decisions that determine the quality and direction of their lives (Sanoff, 2000).

For Japan, the term workshop was first introduced during the IFEL (The Institute For Educational Leadership: IFEL) courses as training for teachers in the education sector by IFEL from USA in 1948. By IFEL, workshop is widely defined as implementation research to solve a problem by a small group, which consists of less than 10 persons used as a training method in Japan (Nakaya, 1987). In a sector of *machizukuri* (community-citizen vitalization initiatives), a workshop approach has been used as participation method since the 1980s.

K. Numa et al. define that participatory workshops are widely accepted for learning and creation. Workshop means a participatory and experiential group work-based style for learning and creation. Learning and expressing will be activated in the group, which shares a place and experiences (K. Numa et al. 2008).

Although workshops are considered as one of participatory approaches, this research uses the term “*participatory workshop*” to emphasize that residents are assumed to participate as main actors to improve disaster reduction at the local community. Types and degrees of participation may be determined by several factors. Burns (1979) classifies participation into four categories that can lead to agreement about what the future should bring: Awareness, Perception, Decision Making,

Implementation. In this dissertation, the whole process of achieving the above four levels of participation is called “Collaborative Development”. Then, we identify the following two levels of participation: weak participation as government/expert-led approach, and strong participation as citizens/residents-led approach positive attitudes of participants in a workshop. A participatory workshop is therefore distinguished from an ordinary workshop and assumes both strong participation and collaborative development as shown in Figure 2.1. In order to maximize the effects of participation, the process of a workshop should be clear, communicable, and open. It should provide participants with a means to encourage dialogue, debate, and collaborations.

In this dissertation, a participatory workshop for disaster reduction at the local community level is defined as follows:

A participatory workshop for disaster prevention at the local community level is the process of collaborative group work to improve disaster reduction activities, including both pre- and post-disaster; developed between residents as main stakeholders for implementation as a community with sharing of a local context situation and collaboratively strategizing. Participants can consist of individuals, local community groups and local community related third organizations, such as NGOs, NPOs, and universities.

A participatory workshop is also considered to produce outcomes of collaborative group work. In this dissertation the term "workshop method" is used to specifically refer to its aspect of tool or model.

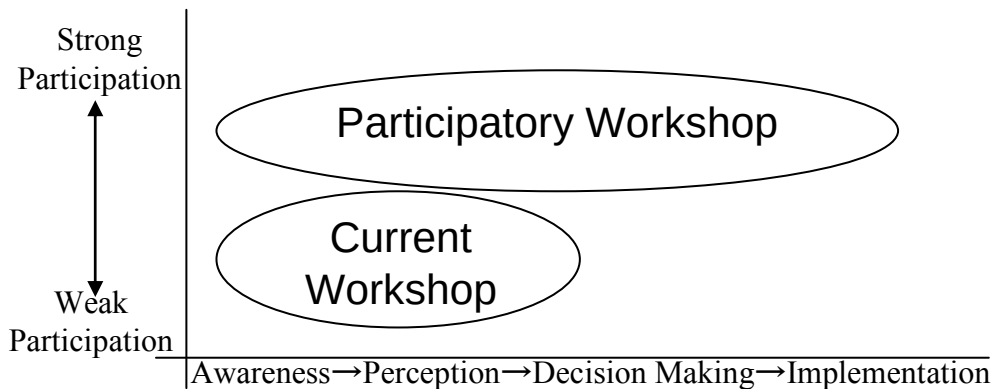


Figure 2.1 Distinguisher between a Workshop and a Participatory Workshop for disaster prevention at local community level

Through a participatory workshop for improving disaster risk reduction, participants can learn, discuss, and carry out activities to save their lives and property prior to a disaster situation. A participatory workshop is a necessary step leading to real disaster reduction activities, instead of just improving awareness for disaster risks.

There are three workshop methods related to disaster risk reduction at the local community level in Japan. Some of the most significant workshop methods are briefly described in the following sections.

2.2.2 Crossroad Game (Kobe version)

The Crossroad Game (Kobe version) presents the participant with descriptions of various situations after an earthquake disaster. The participant should decide what to do when confronted between two conflicting choices; usually consisting of “Yes” or “No” choices. Through discussion after making the decision, the participants will be able to extract basic essentials of disaster risk management. For example, a participant must decide whether to help evacuate an elderly neighbour or not when his/her own life is in danger.

The “situations” of the Kobe version were developed based on a series of group-rows interviews with more than 1500 people who experienced the 1995 Great Hanshin Earthquake disaster. The Crossroad Game was developed by K. Yamori, T. Kikkawa, and T., Ajiro in 2004 (Yamori, 2007; 2008). The Crossroad Game of Kobe version has been published throughout Japan with about 25,000 copies of the game kit in print, as well as through mass media including television, newspapers, magazines, etc. (Study Center for Engineering Science Gadjah Mada University and DIs Prev Res Institute Kyoto University, 2009) .

Through a Crossroad Game workshop, participants can understand conflicting behaviour of those who choose “Yes”or “No”in some situations after earthquake disaster. However, in some cases participants who experienced the Great Hanshin Earthquake disaster just present their experiences of behaviour, but do not discuss the various choices in situations after disaster situations. The detailed procedure of the Crossroad Game is explained by Kikkawa et al.(2004). The general methodology is presented below:

☐ Objective: Simulating decision making scenarios following a disaster in a community

☐ Process:

- 1) A facilitator first takes an example of real life disaster situation or event and asks the participant to presume that such situation prevails in the present local context.
- 2) Now the respondents are asked to express their opinion about various action related to reduce risks under such situation.
- 3) In order to know the participants’ point of view, a series of question are asked. The participants are asked to chose “yes” or “no” answer for each question.

4) Each participant is asked to give an explanation of his or her opinion.

5) Being exposed to the views and perception of the other participants on various aspects of disaster risk reduction action help the community to come into a consensus by reducing conflicting views.

The advantages of Cross Road Game include (Study Center for Engineering Science Gadjah Mada University and DIs Prev Res Institute Kyoto University, 2009):

- 1) Collaborative and participative learning rather than individual and passive learning
- 2) Creating one's own view rather than just accepting expert's and/or disaster veteran's opinions
- 3) Thinking deeper by trying to refine one's opinion to persuade others or not to be persuaded by others
- 4) Rethinking one's idea by facing the diversity of views and thoughts in free discussion with other participants
- 5) Mutual information sharing rather than one-way information flow

2.2.3 DIG (Disaster Imagination Game)

The Disaster Imagination Game (DIG) is a workshop method developed for disaster drills, based on the know-how of the Commanding Post Exercises of the JSDF (Japan Self-Defense Forces) by Komura and Hirano in 1997. It uses local maps and transparent overlays. Participants of DIG will be appointed by the members of the virtual commanding post of disaster relief activities. By recording various details on maps, participants can easily grasp the situation of affected areas, and also be able to discuss how to command relief activities. Exchange of ideas and views of the participants of DIG will deepen their understanding on relief activities.

The characteristics of DIG are: (Komura, Hirano,1997)

- Its simplicity
- It is participatory
- Good cost-performance
- It stimulates the imagination
- It is creative.

Not only professionals but also residents can participate in a DIG workshop without special knowledge. Generally, a facilitator gives all the situations of post-disaster to participants, the

participants solve some problems prepared by a facilitator on their local map in a DIG workshop. The current DIG method is divided into three-stage level depending on participants level and situation of set-up places (Komura, 2004). The DIG workshop method has been applied in Shizuoka prefecture, Aichi prefecture, and Hyogo prefecture.

Komura (2004) explains the detailed procedure of the DIG presented below:

□ Objective:

The Objective of this workshop is to identify the potential hazards in the area, and to identify and recognize the action that are required to take in post-disaster phase. The workshop particularly focuses on individuals' personal views and perceptions.

□ Process:

1. The workshop methods and procedures are introduced by a facilitator or group of facilitators to the community members.
2. The workshop starts with risk mapping and risk identification. In order to do risk mapping, a base map of the local area is provided to the participants. Covering the map with a transparent sheet, the participants, mostly the local residents, are asked to identify and mark on the transparent about the potential strength and weakness exist in the area, like identification of public building, roads, natural resources, geographical nature of each site etc.
3. After this participatory mapping, the facilitator introduces a disaster like situation and asks the participants to indicate their possible action which the participants think are required to take in order to reduce the risks and to cope with the situation.
4. Finally, a summary of the findings based on the discussion are presented in front of the participants.

However, Ohnishi (2005) points out that the discussion level of participants is determined by the level of preparation of the facilitator in the DIG workshop to experience the use of the hazard map (Ohnishi, 2005).

2.2.4 Disaster Risk Scenarios Workshop

The Disaster Risk Scenario method is designed by Tsubokawa as a workshop method for residents of the communities to manage evacuation shelters after earthquakes, since this social unit is capable of the greatest cooperation at times of disaster. The workshop involves the preparation of scenarios as a way to promote a better understanding of the management of evacuation shelter and

promote the restructuring of local risk governance. In the process of scenario preparation, residents are assigned the roles of various parties including government officials and agencies related to the evacuation center (Tsubokawa et. al. 2008).

The detailed procedure of the Disaster Risk Scenario Workshop is explained by Tsubokawa et al.(2008). The general methodology is presented below:

□ Objective:

The major focus of the workshop is to design an evacuation plan for earthquake disaster in order to systematically manage and arrange the roles of various stakeholders.

□ Process:

1. Like other workshops, the facilitator in this workshop introduces the workshop method to the participants and also the potentials risks are introduced and discussed by the facilitator.
2. Unlike other workshops, not only the community members, but also other stakeholders participate in this workshop.
3. In next step, the facilitator assigns a particular role to each participant and the participants are asked to make an evacuation plan according to his own assigned role. The assigned role are divided into three groups, each of them representing a particular stakeholder – “Community”, “Government”, and “Business”.
4. Finally, the results or the action plan generated through the workshop are discussed among the participants to share each other’s views.

However, the role of participants in a workshop ends as a virtual role. This workshop method has the problem of limited effectiveness for disaster prevention education because it improves awareness but does not necessarily lead to action. Participants may find it difficult to imagine the disaster scenarios that have been prepared by the facilitator (Tsbokawa, Nakasaka and Usuda, 2008).

2.3 The problems of the current workshop methods for disaster reduction in Japan

This section will highlight the current problems that pertain to disaster workshop methods in Japan. It is important to note that problems are closely linked to the social issues of participatory workshops that I discussed in Section 2.1.

Most workshop methods for disaster reduction in Japan currently target rescue and relief activities in post-disaster situations. As currently observed, the general objective of a workshop for residents is to share risk awareness and to provide a means of communication for participants (Na, Okada, and Takeuchi, Y., 2008). However, such workshops have the limitation that risk awareness does not lead to action plans in disaster prevention activities. Risk awareness should be improved to implement actions to optimize the capacity of a local community in disaster situations (Na, Okada, and Fang, 2008).

Currently, only workshop methods mainly focusing on post-disaster activities have been proposed in Japan. Table 2.1 shows the main features of three workshop methods for participatory community-based disaster reduction in Japan.

The general characteristics of these methods as problems are as follows:

- 1) The workshop methods focus mainly on risk awareness and risk communication from an individual's perspective, rather than on risk mitigation and preparedness actions from the local community's viewpoint.
- 2) All of the workshop methods currently focus mainly on the post-disaster situation, rather than on the pre-disaster phase or on mitigation and preventive measures.
- 3) All of the workshop methods focus more on the individual decision-making process and explore personal or individual capacities and resources to create individual actions, rather than focusing on community-based collaborative action planning.
- 4) All of the workshops are very dependent on facilitators not only for their facilitation skills, but also for setting up workshop themes and scenarios. For example, a facilitator determines the potential disaster risks to the community as well as the roles and responsibilities of the community members. As a result, most of the workshop methods are unable to accurately reflect the views of the local communities regarding their requirements and needs, nor take their unique resources and capacities into consideration.
- 5) All of the workshops are of short duration and normally take place only once. Therefore, it is not possible to check whether the decisions and plans derived from the workshops have been implemented.
- 6) Little attention is paid to the local context. Instead, a hypothetical situation is often considered in a workshop. As a result, the workshop is unable to produce a realistic action plan based on the local context. All of the workshops are of short duration and are normally a one-time event.

Therefore, it is not possible to check whether the decisions and plans derived from the participatory workshops have been implemented.

However, these workshop methods are useful in providing a means of communication for participants with respect to disaster prevention and enhancing participants' disaster risk awareness. These workshop methods are also valuable for stimulating participants' interest in disaster reduction activities.

Table 2.1 Characteristics of other workshop methods*

	<i>DIG</i>	<i>Crossroad Game</i>	<i>Disaster Risk Scenario Workshop</i>
<i>Objective</i>	Identifying potential hazards and actions following a disaster	Simulating community decision-making scenarios following a disaster	Simulating evacuation actions by stakeholders following a disaster
<i>Who Decides the Theme and Scenario</i>	Set by a facilitator	Set by a facilitator	Set by a facilitator
<i>Participants</i>	Residents	Residents	Specialists, Residents
<i>Facilitator</i>	Specialists	Specialists	Specialists
<i>Typical Size</i>	Multiple teams, small groups (10 people)	Multiple teams, small groups (5~7 people)	One team, one group (10 people)
<i>Outcomes</i>	Risk communication: Raising awareness	Risk Communication: Virtual experience, Understanding the situations of each other	Risk communication among stakeholders

*Based on Komura and Hirano (1997), Komura (2004), Tsubokawa et al.(2008),Ichiko et al. (2005), Kikkawa and Yamori (2006).

2.4 Conclusions

This chapter described the definition of participatory workshop and introduced the current workshop methods for disaster reduction at the local community level in Japan. First part describes some of the disaster reduction issues Japanese society is now facing, and explains why participatory workshop is useful as one approach to improving the capacity of local community in disaster. Next, a summary of several other workshop methods of Japan is presented, and the current problems of participants not going beyond the awareness stage in disaster prevention is identified. The current workshop methods focus mainly on risk awareness and risk communication from an

individual's viewpoint, rather than on risk mitigation and preparedness actions from the local community's viewpoint. Next chapter suggests that the participatory workshop method, we called the Yonmenkaigi system method be used to develop action plans for disaster prevention activities created by the participants themselves.

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Chapter 3 The Yonmenkaigi System Method

3.1 Introduction

Chapter 2 reviewed the current workshop methods for disaster reduction at the local community level in Japan. We empathized that such workshop methods have the limitation that risk awareness does not lead to action plans in disaster prevention activities.

Chapter 3 describes a detail explanation of the Yonmenkaigi system as a participatory workshop method. It includes a brief history, an overview, and the process of the Yonmenkaigi system, which has been improved and used for collaborative action development to improve disaster reduction at the local community level. Next, the chapter focuses on the debating process of the Yonmenkaigi system as the multi-level knowledge development process between participants of a Yonmenkaigi workshop. Finally, we analyze the features of the Yonmenkaigi system method comparing with other methods as a participatory workshop.

The Yonmenkaigi system method has two main objectives. The first is to obtain knowledge that is linked to action from each participant. The second is to develop a collaborative action plan at the local community level so that participants are able to achieve more than enhanced risk awareness and to develop communication among the participants. Collaborative activities between residents and their community are an important and necessary element in improving disaster prevention activities in local communities.

3.2 Outline of the Yonmenkaigi system

The primary objective of the Yonmenkaigi system method is to develop a collaborative action plan for a community in a workshop with a disaster risk context. In order to achieve the objective, the system method focuses on four broad aspects of management, public relations (PR) and information, soft and hard logistics. These four aspects (roles) are considered required issues for future action. The time dimension is also considered with each of these role-sharing elements.

Participants of a Yonmenkaigi workshop first collect information and knowledge from a community diagnosis exercise and then decide for themselves on the theme/goal of the action plan. Afterwards, the action plan to achieve their goals, as well as a plan for its implementation, are developed by participants.

A Yonmenkaigi workshop provides a platform for face-to-face communication for participants to become aware of the concerns of others, to discuss the current state of their community and to collaboratively develop an implementable action plan. In this workshop method, the process of making collaborative action plans is systematically developed. Other workshop methods lack this type of system. The emphasis of a Yonmenkaigi system method is on disaster mitigation and prevention rather than on post-disaster situations. In a Yonmenkaigi workshop, participants serve the roles of both planners and executors as subjects of the action plans. The basic characteristics of the Yonmenkaigi system are summarized in Table 3.3.

Each of these role-sharing elements is combined with a time dimension. Figure 3.1 shows the changing perspectives of the Yonmenkaigi system, which includes both individual and community views through the process of group discussion.

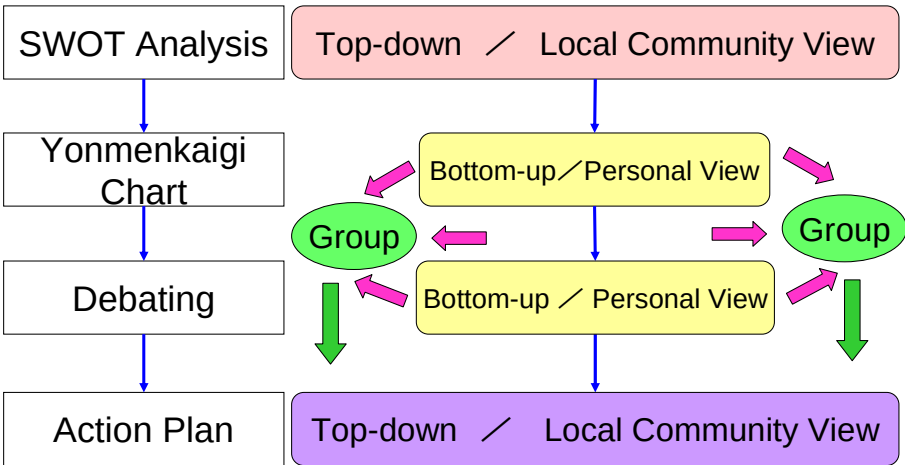


Figure 3.1 Changing perspectives of the Yonmenkaigi system

Participants of the Yonmenkaigi system address a problem based on information and knowledge obtained from the community diagnosis and then make decisions. Afterwards, the participants decide for themselves on the theme/goals of the action plan. Finally, they develop an action plan to achieve their goals, as well as a plan for its implementation.

3.2.1 The CAPD Cycle in the Yonmenkaigi system

Matsuda and Okada (2006) argue that before one makes an action plan, it is important to first make a diagnosis of the problem. This concept refers to a CAPD concept which was proposed by Okada

and Teratani (2005). The concept of CAPD will help to structure the stepwise processes from the Yonmenkaigi system. CAPD may occur in a big cycle consisting of C (check), A (Action), P (Planning) and D (Do). It can also occur in several CAPD processes with smaller CAPD cycles. The process of a Yonmenkaigi is a reflection of this CAPD management cycle.

The Yonmenkaigi workshop process, which will be discussed below, includes four steps as shown in Figure 3.2: carrying out a SWOT analysis, completing the Yonmenkaigi Chart, debating, and presenting an action plan chart.

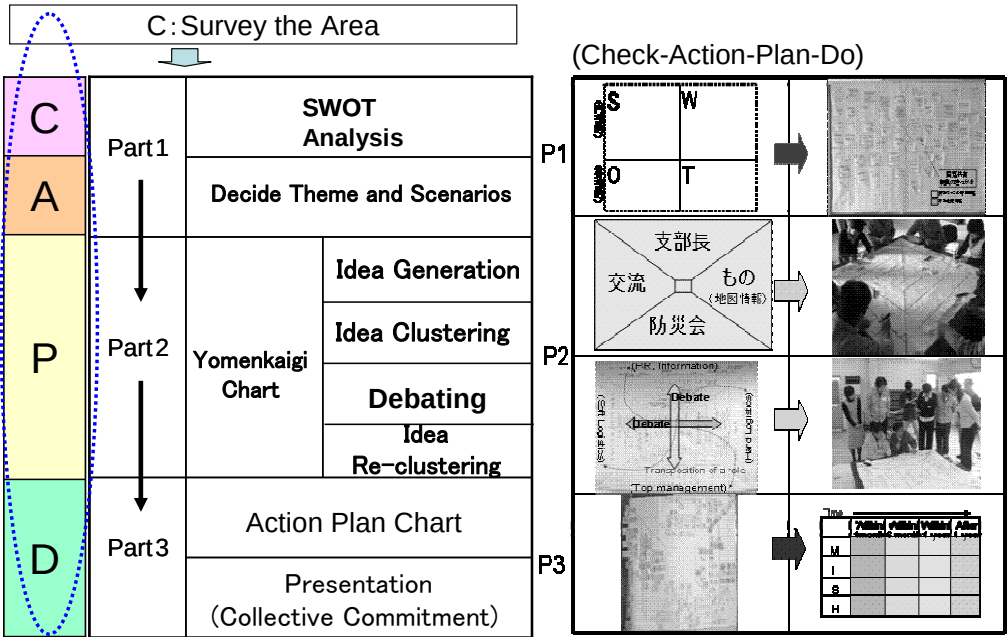


Figure 3.2 Process of the Yonmenkaigi system

The four steps of the Yonmenkaigi system closely reflect the CAPD management cycle. The first step in the process is to carry out a SWOT analysis (Hill and Westbrook, 1997). SWOT analysis involves identification of the strengths and weaknesses of a local community as well as the opportunities of and threats to the community. Analysis and diagnosis of strengths and weaknesses correspond to check (C) from the CAPD cycle. Participants then determine the theme/goal, taking into account the conditions of the community through shared recognition of risks and issues identified in the SWOT analysis. This aspect corresponds to action (A). Once the check and action processes are completed, the participants move to the plan (P) aspect in the workshop by constructing the Yonmenkaigi Chart in which participants set out the vision and action plans. Finally, the workshop includes a debating phase and the creation of an action plan chart. During this process, participants debate with each other to improve the action plan and to ensure the feasibility of action plan components as well as to ultimately draw up a final action plan chart for the future. These two processes correspond to the do (D) phase of the CAPD cycle.

3.2.2 The history of the Yonmenkaigi system method

The Yonmenkaigi system method was originally designed and used for collaborative action development for a small group in community-citizen vitalization initiatives called *machizukuri* in a mountainous municipality of Chizu-cho, Tottori, Japan. Now, the Yonmenkaigi system method has been applied to disaster reduction management and community-citizen vitalization for sustainable community development both rural areas and urban areas in Japan (1996, 2005, 2006, 2008, 2009, 2010), Indonesia (2009, 2010), and Korea (2009), etc

3.2.2.1 Community-citizen vitalization initiatives

Hayase village in Chizu district of Japan used the Yonmenkaigi system method as community-citizen vitalization initiatives to create the vision and the plan in future of ten years to improve 1/0 Movement Activity of local community in 1996 as shown in figure 3.3. During ten years, Hayase village practiced action plan components of 66% in total action plan of the Yonmenkaigi chart.

Yamasato Area of Chizu district used the Yonmenkaigi system method as collaborative development to create the action plan to improve their local community in January 2008 (Na, Okada, and Takeuchi, 2008).

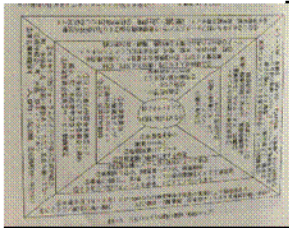
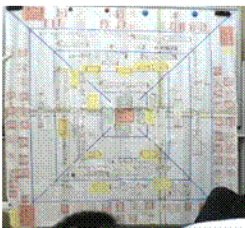
1991	1996	2005
Project type model	Plan and Project type model	Plan and Project type model
Sugi-Forestpia	Hayase village	Obuse
1. Top management 2. PR&Information 3. Soft logistics 4. Hard logistics	1. Autonomy 2. Interchange 3. Management 4. Hard logistics	1. Top management 2. PR&Information 3. Soft logistics 4. Hard logistics
		

Figure 3.3 Implementation of YSM for Community-citizen Vitalization Initiatives in Japan

3.2.2.2 Disaster reduction in local community

Yamasato Area in Chizu town applied the Yonmenkaigi system method as working assignment of community event for disaster reduction to create action plan of open ceremony of local community in June 2008. Shuhachi community in Kyoto City carried out the Yonmenkaigi system method as collaborative action plan to make the hazard map of local community in January 2008, as shown below in Figure 3.4.

2008, 1	2008, 6
Project type model	Project type model
Kyoto City	Yamasato Area
1. Top management 2. PR 3. Human Resource 4. Physical resource	1. Top management 2. PR&Information 3. Soft logistics 4. Soft logistics
	

Figure 3.4 Implementation of YSM for Disaster Reduction in Japan

3.3 The processes of the Yonmenkaigi system method

3.3.1 SWOT Analysis

The Yonmenkaigi system method starts with a SWOT analysis (Hill and Westbrook, 1997). During this phase, a pilot survey of the area is carried out by the participants. Town watching is one of the methods used for conducting this type of pilot survey. Knowledge and information about the present situation of the community is essential in order to identify its strengths and weaknesses and to develop an action plan for it. Town watching can help participants or members of the local community re-evaluate the issues of the local area.

Once the survey is completed, participants get together and identify the strengths and weaknesses of the community through a SWOT analysis. SWOT analysis consists of four components of the community—strengths, weaknesses, opportunities, and threats—as shown in Figure 3.5. In terms of the Yonmenkaigi system, Strengths (S) and weaknesses (W) are considered to be the internal factors controlled by the community residents themselves, while opportunities (O) and threats (T)

are considered external factors including the natural environment as well as socioeconomic trends and patterns.

internal factors	
S	W
external factors	
O	T

Figure 3.5 SWOT analysis in the Yonmenkaigi system

SWOT analysis helps us to see the present and future risks to a community and therefore helps us to recognize future actions required to cope with such risks. Since each of the participants has a different socioeconomic background, each of them perceives different potential and existing risks to the community. Furthermore, each of them has different innovative ideas to cope with such problems. SWOT analysis helps all the participants know each other’s ideas and views. SWOT analysis provides the participants with an opportunity to share their ideas and views, which eventually leads to a holistic and detailed view of risks and future action plans. In a SWOT analysis, the participants express their views by using various colors of cards. Generally, four color cards are used in this process, corresponding to the four SWOT categories.

3.3.2 Identification of Themes and the Four Groups

Based on the SWOT analysis, the participants propose themes as goals and scenarios to consider. The facilitator collects all of the proposed themes and scenarios and presents them on large sheets of paper (788 mm x 1091 mm), which extend for several pages. Then, the participants themselves decide the theme of the workshop and the scenarios to consider.

After selecting a theme, the participants are divided into four groups. As shown in Figure 3.6, each group of individuals is assigned to the particular role-sharing activities in one of the four groups of role sharing—management, PR & information, soft logistics, and hard logistics. Each individual is assigned to a particular role-sharing group not only according to his/her organizational responsibilities, vocational activities, and socioeconomic status, but also according to his/her talents, abilities, and interests. To achieve a particular theme/goal, actions on the four broad aspects of management, PR & information, soft logistics, and hard logistics are generally required.

However, these aspects may be modified/redefined depending on specific circumstances of a workshop.

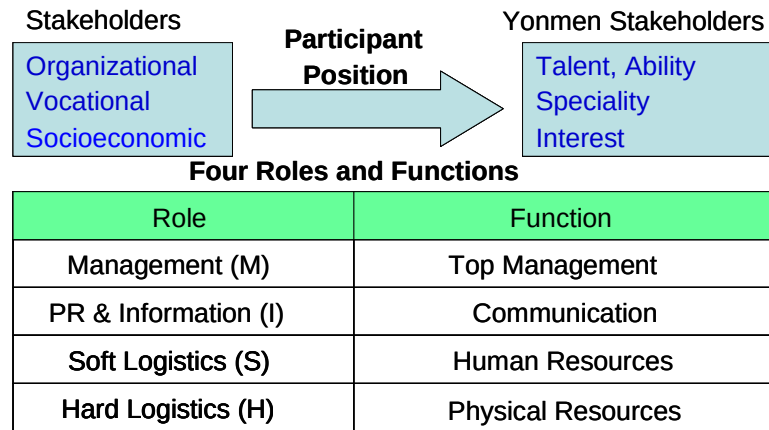


Figure 3.6 Four stakeholder roles and functions in the Yonmenkaigi system method

3.3.3 Yonmenkaigi Chart

Once role assignment is completed, the participants are asked to express their action components and views according to their assigned role by using color cards in a specially designed chart called the Yonmenkaigi Chart, as shown in Figure 3.7. The action components for each of the aspects are divided or compartmentalized in a time frame. For example, the action components of each group can be scaled as within 3 months, within 6 months, within 1 year, and beyond 1 year. Participants discuss within their groups and plan the actions for the assigned aspect accordingly. The implementable collaborative action plan is a coordinated combination of the action plans developed through these four aspects.

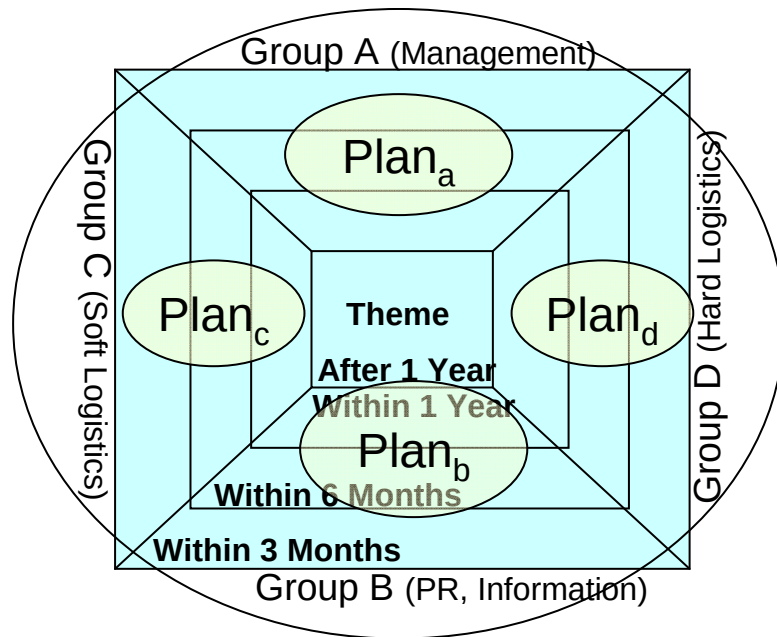


Figure 3.7 Typical pattern of the Yonmenkaigi Chart

3.3.4 Debating

The next phase of the Yonmenkaigi system method is debating. The Yonmenkaigi system method offers two types of debating—general debating and inverse debating. General debating involves inter-group debating, whereas inverse debating involves exchanging the positions and roles of two groups facing each other across the Yonmenkaigi Chart. More specifically, if Group A challenges the ideas of Group B and the two groups debate with each other, then it is called a general debate. On the other hand, if Group A moves from its original position to the position of Group B and Group B moves to the position of Group A and both groups start to debate according to their new roles, such a debate is called inverse debating, as shown in Figure 3.8.

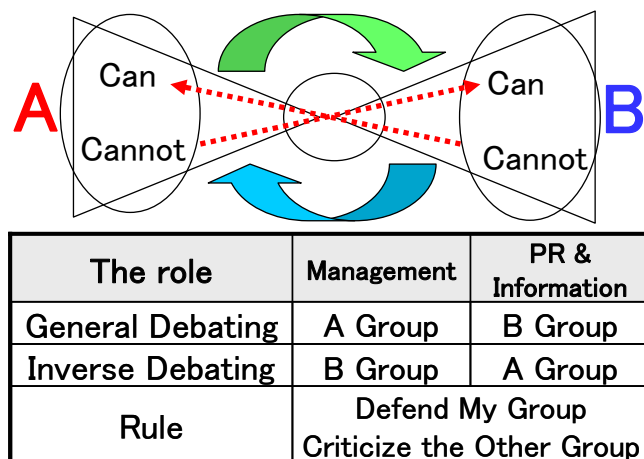


Figure 3.8 Inverse debating in the Yonmenkaigi system

Debating provides an effective platform for combining different ideas or views and strategically processing those ideas and knowledge to create new knowledge. Debating allows each group and each individual to express and defend their views and ideas and to criticize others. Through this process, communication is enriched between groups as well as between participants who observe and listen to each other's ideas and views. Inverse debating forces each group to defend what the opposite group intends to produce as its respective action components. It also requires each group to criticize the previously revised version of what the group has planned. Inverse debating is an important feature of the Yonmenkaigi system. Debating can also enhance the implementability of action components.

After completing all the debating processes, the groups separate and share action plan components as required. Participants work together and own the entire action plan to achieve their goal/theme in common. The entire process of general and inverse debating helps consolidate and upgrade the quality of actions to be implemented in the collaborative action plan.

3.3.5 Action Plan Chart

Participants now determine an implementable collaborative action plan after debating by using the Yonmenkaigi Chart. Action plan components are rearranged by a time frame and the roles of the four groups (management (M), PR & information (I), soft logistics (S), and hard logistics (H)), as shown in Figure 3.9. In this phase, the participants decide and prioritize the action plans based on a time scale. Prioritization is conducted on a timeline basis depending on the time scale, for example, within 3 months, within 6 months, within 1 year, and beyond 1 year.

Time 

	3 Months	6 Months	1 Year	Beyond 1 Year
M				
I				
S				
H				

Figure 3.9 Action plan chart in the Yonmenkaigi system

Based on the action plan chart, the participants are requested to make a presentation using the roles and timelines of their entire action plan to an audience who has not been directly involved in making the plan.

3.4 Comparisons with other methods

The basic characteristics of the Yonmenkaigi system are summarized in Table 3.1. The discussion in Section 3.2, and 3.3 shows to what extent the Yonmenkaigi Workshop method differs from other workshop methods. However, for better conceptualization of the uniqueness of the Yonmenkaigi method, the following points can be made:

Unlike other workshop methods, in a Yonmenkaigi workshop, the participants themselves, instead of the facilitator, decide the theme and scenarios and develop the action plan, on their own, in order to achieve the goal/theme.

Each action component of the action plan is systematically examined to ensure a continuing (sequential) relationship between the action components of the same group as well as between other groups in order to accomplish the action plans. Debating, including general and inverse varieties, is introduced for this purpose in the Yonmenkaigi workshop method. The debating sessions provide the unique opportunity for the participants to learn the collaborative decision-making process, setting the Yonmenkaigi method apart from other workshop methods.

The Yonmenkaigi workshop provides a platform for face-to-face communication for participants to become aware of the concerns of others, to discuss the status quo of their community, and to collaboratively develop implementable action plans. In this workshop method, the process of making collaborative action plans is eventually systematically incorporated. Other workshop methods lack this type of system.

Unlike the Yonmenkaigi workshop method, other workshop methods focus more on the individual decision-making process and explore personal or individual capacities and resources to create individual actions, rather than focusing on community-based collaborative action planning. In contrast, the Yonmenkaigi workshop method not only identifies and explores personal capacities and resources as well as individual ideas and views, but it also provides a basis for working together by focusing on each other's views. This strengthens the basis of collective and collaborative action planning.

Unlike other methods, the Yonmenkaigi system focuses more on disaster mitigation and prevention rather than on post-disaster situations.

In the Yonmenkaigi workshop method, participants take the roles of both planner and executor as the subjects of the action plans.

Table 3.1 Basic characteristics of the Yonmenkaigi system

<i>Application</i>	Disaster mitigation and prevention
<i>Objective</i>	Collecting visions and hopes of residents for proactive disaster reduction planning
<i>Who Decides the Theme and Scenario</i>	The facilitator suggests guidelines and participants determine the theme and scenarios.
<i>Participants</i>	Self-governed community association for disaster reduction (as representatives of residents)
<i>Facilitator</i>	Specialists
<i>Typical Size</i>	One team (8 to 16 people), four groups (2 to 4 people each)
<i>Outcomes</i>	Development of an action plan for disaster reduction for the local community

3.5 Collaborative action development during debating process

In the Yonmenkaigi workshop method, cards are an important component or tool for participants to express reviews and exchange their views and ideas, particularly during the debating phase. There are several basic rules for the movement of cards, and each of the card movements bears a particular meaning in placing and shifting during debating. Card movements reflect the multi-level knowledge development process of the debating practice. Some of the basic rules of card movements, as illustrated in Figure 3.10, are:

- 1) Adding a new card: The addition of a new card indicates that a new action plan component has been identified and prepared in order to achieve the group mission.
- 2) Moving a card: Moving a card from one group to another indicates that the action plan component is more suitable or preferable for the shifted group than for the original group.
- 3) Deleting a card: Deleting a card indicates that such an action component is no longer required or desirable. In other words, it indicates that such an action component cannot be carried out.

4) Renewal of a card: This movement indicates that reinforcement of an action plan component is needed in order to reduce the weakness of the group.

5) Arrangement of cards: Cards are arranged and grouped by taking into consideration the time scale of the action plan component.

6) Collaboration of cards: This indicates that the groups concerned or overlapping groups will work together and collaborate on the same action plan component. Because each of the groups has its own limitations, some action plan components require collaboration across the groups to manage the action plan components.

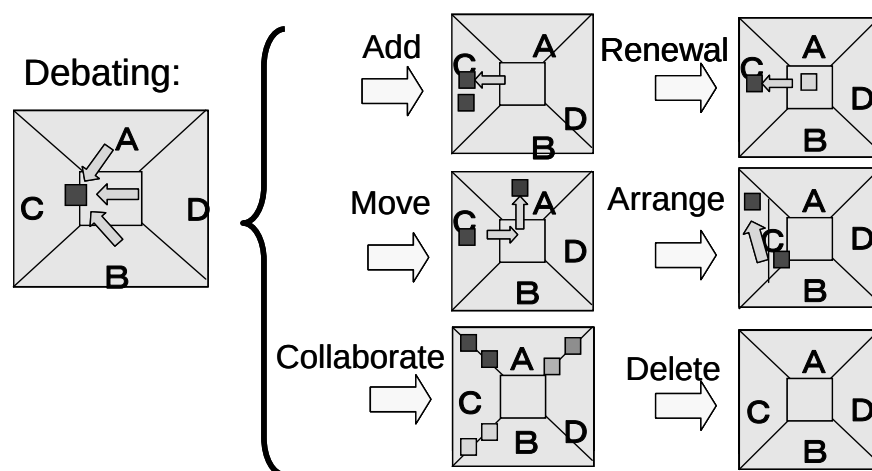


Figure 3.10 Card movements during debating

3.6 Conclusions

As participants can consider behaviours among them on some situations after earthquake disaster through a workshop using a crossroad game, the participant of a Yonmenkaigi workshop can also become familiar with the action plan of each group and understand what vision/hope participants have in their local community. Additionally, participants can share the vision among each other through the process of creating a goal to improve coping capacity of their local community in a Yonmenkaigi workshop. In summary, a Yonmenkaigi workshop can provide not only with the development of detailed action components, but can also facilitate mutual understanding of the goals among the participants.

In chapter 3, the Yonmenkaigi system method has been presented as a participatory workshop to develop collaborative action plans at the community level. Implementable action plans are developed by participants working in collaborative partnerships through the Yonmenkaigi system method. The Yonmenkaigi system method serves as a means to move from risk awareness to action

plan development for disaster reduction. Through this method, participants have been shown to expand their capacities and to learn the importance of collaborative action in disaster prevention. The Yonmenkaigi system can enhance the understanding of participants.

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Chapter 4 Implementation of the Yonmenkaigi system as participatory workshop method for local community disaster reduction in Japan

4.1 Introduction

Chapter 3 explained the Yonmenkaigi system method, which has been proposed to create collaborative action plans for improving disaster reduction capacity in communities.

In chapter 4, a Shuhachi Yonmenkaigi workshop, which was conducted for a Jishubosai-soshiki (Self-governed Community Association for Disaster Reduction) in the City of Kyoto, Japan, is used as a case study to demonstrate collaborative action development at the local community level. An action plan consisting of many action components is developed. Relationships of action plan components are analyzed using the Interpretive Structural Modeling (ISM) method.

In order to reduce disaster impact at the local community level, collaborative action is necessary. Risk awareness should lead to implementable actions to improve the capacity of a local community in disaster situations. Workshop methods can be used to develop more effective action plans at the community level that include collaborative decision-making techniques among residents for proactive disaster management.

4.2 The Shuhachi-bosaikai Case Study

4.2.1 Shuhachi-bosaikai

The Shuhachi community is located in the Shuhachi elementary school area, Nakagyo Ward, Kyoto City, Japan. It is an urban residential area in the center of the City of Kyoto having 10,939 residents (as of 2005) over an area of 1.055 square kilometers. It is further divided into 52 smaller community units (chonai/chonai-kai), which are neighborhood associations and are the smallest collective self-governing units in Japan (Nitschke, 2003).

There is a Jishubosai-soshiki (Self-governed Community Association for Disaster Reduction)(Government of Japan, 2008) in the Shuhachi community. The Jishubosai-soshiki has a headquarters (Shuhachi-bosaikai) and one or two representative members from each chonai-kai. The Shuhachi-bosaikai is a group organized by residents for the purpose of disaster prevention. It organizes and implements self-motivated disaster prevention activities in the Shuhachi community. According to chonai-kai rules, representatives from the chonai-kai are changed every year or two.

The Shuhachi-bosaikai has established a disaster prevention partnership with the local fire station in the Shuhachi community.



Figure 4.1 The Shuhachi-bosaikai

4.2.2 The Shuhachi Yonmenkaigi workshop

A Yonmenkaigi system workshop was conducted in the Shuhachi community in order to create an implementable action plan for the “safety and security mapping of the community.” Eight individuals from the Shuhachi-bosaikai participated in the workshop. The workshop, which lasted three and a half hours, was held in the Shuhachi community on January 26, 2008. In order to conduct the workshop systemically, the facilitator (the author) first introduced the rules and method of the workshop to the participants. To evaluate residents’ level of understanding and awareness of the present situation of the local community, residents, including members of the Shuhachi-bosaikai, *chonai-kai*, and local fire station, were asked to complete a questionnaire from December 22, 2007, to January 8, 2008. Sixty-five people completed the questionnaire.

The results of the questionnaire helped the participants carry out a SWOT analysis of the Shuhachi community, as illustrated in Figure 4.2. From the SWOT analysis, participants learned that the Shuhachi community did not have a hazard map of their community or a local community-housing map.

S • There is a local fire station. • The Shuhachi community has a large open area in the southern part that can serve as a temporary evacuation area. • The local community is active. • Activities of the Shuhachi-bosaikai • We have many schools as evacuation sites.	W • Narrow roads • Elderly single residents (800 households) • The difference in awareness depends on the <i>chonai-kai</i>. • We do not have a hazard map.
O • The Shuhachi community plans to	T • Increase in apartment buildings

establish a committee for inventory warehouses for storing supplies after a disaster • Awareness of disasters is growing among residents.	• Our community covers the largest area in Nakagyo Ward. • Long distance from the north to the south • Traffic jams are terrible in the tourist season.
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Figure 4.2 Part of the SWOT analysis in the Shuhachi Yonmenkaigi workshop

The participants decided that the theme/goal of the workshop was to make security and safety maps of the community and chose a one-year period as a realistic time frame to implement the plan.

Eight participants were divided into four groups of two participants each to play the roles of management, PR & information, soft logistics, and hard logistics. As shown in Figure 3.7, the functions of the four groups are top management, communication, human resources, and physical resources for achieving the theme/goal of the workshop determined earlier. The timeline of the Shuhachi-bosaikai Yonmenkaigi Workshop is shown in Table 4.1. The time frames for the action plan considered are 3 months, within 6 months, within 1 year, and beyond 1 year.

Table 4.1 Timeline of the Shuhachi Yonmenkaigi workshop

	Process	Time allocated	Time actually spent	Contents
1	Guidance	20 min	21 min (13:24~)	How to use the Yonmenkaigi system
2	Results of the questionnaire & SWOT analysis	15 min	20 min (13:45~)	Reviewing information
		45 min	90 min (14:05~)	Determining the theme/goal and assigning role-playing groups
3	Yonmenkaigi Chart	45 min	22 min (15:35~)	Generating idea cards Developing an action plan
4	Debating	40 min	40 min (15:57~)	Card movements in the Yonmenkaigi Chart
5	Presentation	20 min	13 min (16:37~16:50)	Reorganizing and presenting the collaborative action plan
6	Questionnaire	10 min	20 min (18:00~)	Surveying opinions of participants
	Total time	195 min	216 min (3 hours 36 minutes)	

During the process of generating ideas and developing a collaborative action plan through using the Yonmenkaigi Chart, some of the issues considered were as follows:

It was first determined that there is a need to make a hazard map in the Shuhachi community. The Shuhachi-bosaikai should explain the importance of making a hazard map to the Shuhachi community and ask for the help of representative members of the *chonai-kai*. The Shuhachi-bosaikai recognizes that it does not have enough resources to implement the production of a hazard map. The Shuhachi-bosaikai should request the collaboration of other organizations in the Shuhachi community to carry out this project at the community level. Through this scenario-making process, the Shuhachi-bosaikai recognizes the need for collaborative action in the Shuhachi community.

4.2.3 Collaborative action development during debating process

In the Shuhachi Yonmenkaigi Workshop, as shown in Table 4.2, four groups of management, PR & information, soft logistics, and hard logistics created 18, 18, 18, and 24 action component cards, respectively, for a total of 78 action cards in the Yonmenkaigi Chart before debating. After debating, the numbers of action component cards increased to 21, 27, 21, and 30, respectively, for a total of 99. In Table 4.2, Notice that the cards for collaborative actions are counted in each of the collaborating groups. Therefore, these cards are counted more than once.

Table 4.2 Action plan components before and after debating

	Management (M)	PR & Information (I)	Soft logistics (S)	Hard logistics (H)	Total number of cards
Before debating	18	18	18	24	78
Changes to the action plan components after debating					
Arrange	1	0	1	4	6
Add	2	3	0	3	8
Move	1	1	0	0	2
Collaborate	9	8	4	5	26
No change	8	15	16	18	57
Total number of action plan components	21	27	21	30	99

In the Yonmenkaigi workshop method, cards are used by participants to express and exchange views and ideas. During the debate stage, the multi-level knowledge development process of the debating practice is reflected through card movements. The following examples show changes to the action plan components proposed by the group playing the role of management (the Shuhachi-

bosaikai) after debating, as illustrated in Figure 4.3. Several basic rules for the movement of cards have been developed as follows:

1) Add a new card: a new action component has been identified. During the Shuhachi Yonmenkaigi workshop, for example, the group playing the role of management added a new action component card of collecting cases to show the importance of a hazard map. It was noted that the Shuhachi-bosaikai should collect cases to show the importance of having a hazard map so that other members can appreciate its usefulness. An action component card for creating education flip boards concerning the need for a hazard map was added as a new action plan component. The participants noted that the Shuhachi-bosaikai should make the education flip boards for members of the *chonai-kai* as necessary in making the hazard map.

2) Move a card: the action component is more suitable or preferable in the moved-to group rather than in the original group. An action component card for who will be the main organization to make the hazard map was moved to the group playing the role of management from the group playing the role of PR & information. The participants noted the Shuhachi-bosaikai should be the main organization to carry out the task of making the hazard map.

3) Arrange cards: cards are arranged and grouped by considering the time frames of the action components. An action component card for thinking about the usefulness of the hazard map was arranged from within 1 year to within 3 months in the same group. The participants observed that the Shuhachi-bosaikai should discuss why it needs the hazard map in the Shuhachi community before actually producing it.

4) Collaboration shifts of cards: the action components require more than one group to implement. During the Shuhachi Yonmenkaigi workshop, a total of ten cards were shifted to the border areas between the group playing the role of management and other groups. Among others, these included the action component cards for marking fire extinguishers in the Shuhachi community, meeting with the Shuhachi schools for the hazard map, developing the contents required in the hazard map, and recruiting volunteers in the Shuhachi community to create the hazard map.. The participants noted that the Shuhachi-bosaikai must work together with other groups to perform these action components because its own capacities are limited.

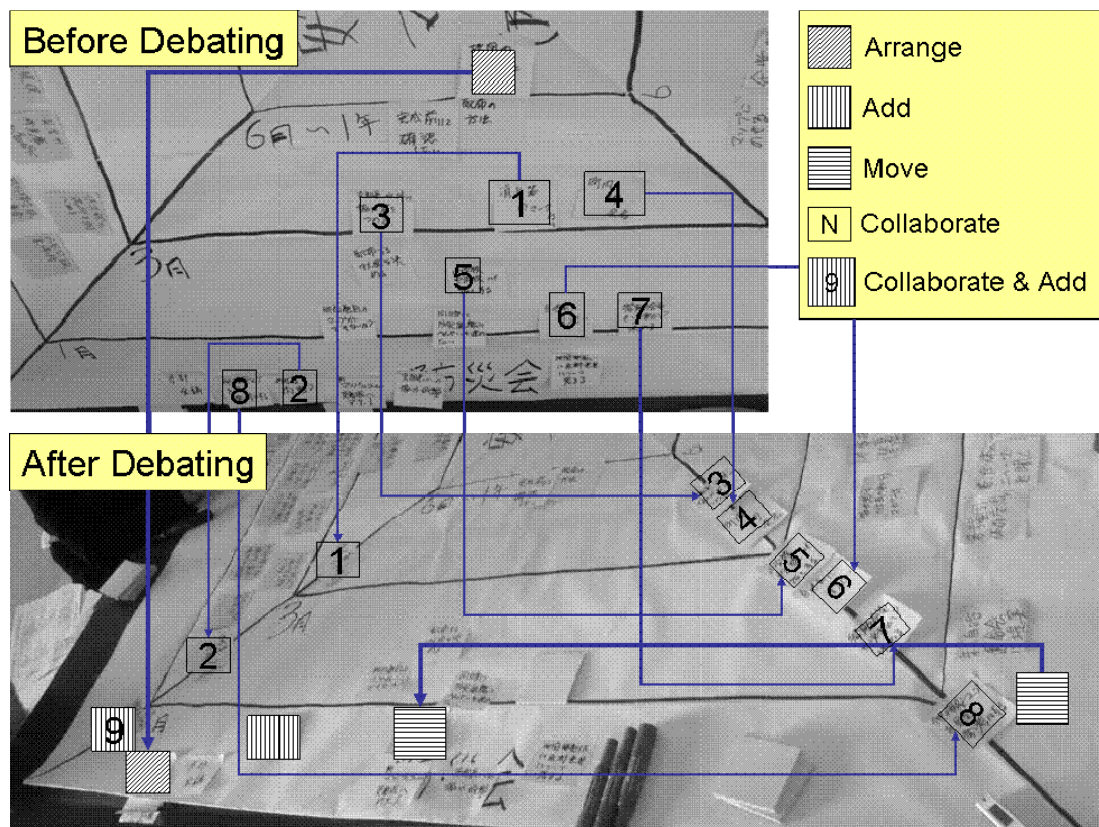


Figure 4.3 Changes to action plan components after debating in the Shuhachi Yonmenkaigi workshop

The action plan chart was completed through the participants' debating. Only some representative action components of the action plan chart developed during the Shuhachi Yonmenkaigi workshop are shown in Table 4.3.

Table 4.3 Partial components of action plans in the Shuhachi Yonmenkaigi workshop

	Within 3 Months	Within 6 Months	Within 1 Year	Beyond 1 Year
Management (M)	Opening the Shuhachi-bosaikai meetings	Request for cooperation from the Shuhachi community	Opening the Shuhachi-bosaikai and <i>chonai-kai</i> meetings	Checking and distributing the hazard map
PR & Information (I)	Request to the Shuhachi community for help in making the hazard map	Recruiting volunteers	Contacting the mass media	Collecting opinions after distribution
Soft logistics (S)	Cooperating with the survey	Request for contents of the hazard map	Town watching in the Shuhachi community	Joining the Shuhachi-bosaikai

Hard logistics (H)	Benchmarking the hazard map with other communities	Surveying the contents of the hazard map	Deciding on the contents of the hazard map and the company that will produce the map	Examining new education tools for disaster reduction
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4.3 Relationships of action plan components using the Interpretive

Structural Modeling (ISM) method

An action plan developed by participants in a Yonmenkaigi workshop usually has many components. It is important to examine relationships among components of an action plan, in particular, precedence relationships among components. Participants may instinctively assess such tasks in a rough manner. In this section, the Interpretive Structural Modeling (ISM) (Warfield, 1973) method is used to methodologically elaborate on the study of relationships of action plan components.

4.3.1 Interpretive Structural Modeling (ISM) method

The ISM method is one of the techniques that analyze complex structures qualitatively from the field of social systems engineering (Warfield, 1976). The ISM method has been applied to a variety of problems including higher education program planning (Hawthorne and Sage, 1975), vendor selection (Mandal and Deshmukh, 1994), group decision making (Bolanos et al. 2005), alliance partner selection (Ma and Li, 2006), and identification and quantification of interactive risks (Gorvett and Liu, 2007).

The ISM method is used to provide fundamental understanding of the structure of complex systems. Generally, complex systems can be divided into several components. In the ISM method, the interrelationships between components are modeled using a relationship matrix. Based on the relationship matrix, a structural graph can be constructed and the relationships of components are illustrated.

4.3.2 Application of the ISM Method in the Yonmenkaigi System

The primary objective of carrying out an ISM analysis in the Yonmenkaigi system method is to identify the core action components of a collaborative action plan by revealing the relationships of action components. The general process of an ISM analysis is shown in Figure 4.4. Given a list of action components, the relationship matrix can be created. By using an ISM application program, the structural graph can be drawn and the results can be analyzed.

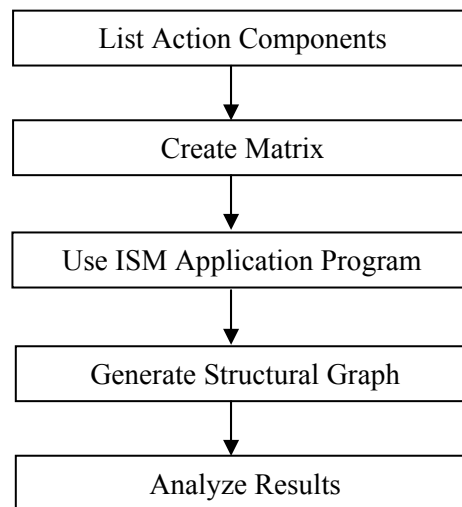


Figure 4.4 General process of an ISM analysis.

As shown in Table 4.2, the Shuhachi Yonmenkaigi system workshop generates 21 action components for the group playing the role of management. These 21 action components are given in Table 4.4. Action component numbers 4, 9, 10, 14, 15, 16, 17, 18, and 19 in Table 4.4 are categorized as collaborative action components.

The relationships of these 21 action components are analyzed by using the ISM Cognitive-networks Applied System, which is available from an open source (<http://web.sfc.keio.ac.jp/~suzuryo/study/ism/src/demo/index.html>.) ISM concepts and techniques make it easier to clarify the order of implementation of the action components to be carried out by the management group of the Shuhachi Yonmenkaigi system workshop. Use of the ISM method improves understanding of the action components of a group. An ISM analysis can also define the structure of the action plan components in the Yonmenkaigi Chart.

Table 4.4 Action Components of the Management Group (Shuhachi-bosaikai)

No .	The Action Components of the Management Group (Shuhachi-bosaikai) in the Shuhachi Yonmenkaigi System Workshop
1	Thinking about the usefulness of a hazard map
2	Collecting cases showing importance of a hazard map
3	Opening the Shuhachi-bosaikai meetings
4	Creating education flip boards describing the need for a hazard map
5	Asking the questionnaires of the new hazard map to members of chonai-kai
6	Deciding who will be the main organization to create the hazard map
7	Asking representative members of chonai-kai for help
8	Considering dissenting opinions of creating a hazard map in the Shuhachi community
9	Reviewing hazard maps of other local communities
10	Considering the contents of the proposed hazard map
11	Discussing the feasibility of making a hazard map of every chonai-kai
12	Determining the distribution area of the hazard map in the Shuhachi community
13	Recruiting new members for the Shuhachi-bosaikai
14	Meeting with the Shuhachi schools about the hazard map
15	Requesting cooperation from the Shuhachi community
16	Determining whether fund-raising campaigns are necessary
17	Marking available fire extinguishers in the Shuhachi community
18	Recruiting volunteers for creating the hazard map in Shuhachi community
19	Opening the Shuhachi-bosaikai and chonai-kai meetings
20	Checking the contents of the hazard map before finalizing
21	Distributing the hazard map in the Shuhachi community

The action components are divided into four time frames in the Yonmenkaigi chart as the accomplishment periods in which action components are achieved (Table 4.4). Within the management group's 21 action components, for example, numbers 1 to 9 are the action components required to be carried out within 3 months. Numbers 10 to 16 are the action components to be implemented within 6 months, while 17 to 19 are the action components to be completed within 1 year. Numbers 20 and 21 are the action components to be carried out beyond 1 year. However, a time frame in the Yonmenkaigi chart does not have the ability to clearly distinguish the order of implementation of the action components in that time frame. Within each time frame, the action component cards are arranged from left to right, according to the timed order of implementation.

For the action components given in Table 4.4, the precedence relationship matrix of the components is shown in Figure 4.5 in which

element A_{ij} is defined as follows: $A_{ij} = 1$ if action component j is a precedent action component for i and $A_{ij} = 0$ otherwise, as well as

$i, j = 1, 2, \dots, 21$ are the action components given in Table 4.4.

Identification of the precedence relationship matrix of the action components was performed by the first author who acted in the role of facilitator in the Shuhachi Yonmenkaigi workshop. For example, $A_{21} = 1$ in Figure 4.5 means that action component number 1 is a precedent action component for 2.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
4	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
5	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	1	0	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0
11	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
12	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
13	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
17	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
18	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0

Figure 4.5 Precedence relationship matrix of action components for the management group (Shuhachi-bosaikai).

4.3.3 Analysis of relationships between action components though ISM method

After the debate phase, the time frames in the Yonmenkaigi Chart were changed from three time frames to four, which added “Beyond 1 year”. Given the matrix in Figure 4.5, by using the ISM Cognitive-networks Applied System, the structural graph is obtained, as shown in Figure 4.6. As can be seen in the graph, the 21 action components were divided into 8 levels, within 4 time frames.

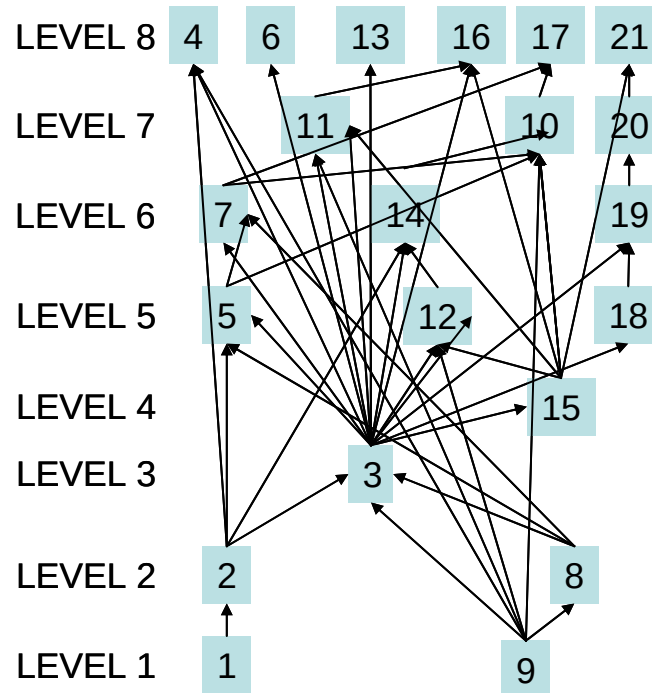


Figure 4.6 Structural graph of action components for the management group (Shuhachi-bosaikai).

The order of implementation for the action components of the management group (Shuhachi-bosaikai) are all connected from Numbers 1 to 21. Each action component is linked to various other components, ranging from 1 to 15. In particular, the Number 3 action component card (opening the Shuhachi-bosaikai meetings) is linked with the greatest number of components (15 components).

To illustrate the use of ISM method, a closer examination of the “within 3 months” time frame and its action component structure is presented. In the time frame of “within 3 months,” essentially, there are three paths of action plan components, which are: Numbers [(1 →2) or (9 →8)] →3 →4, Numbers [(1 →2) or (9 →8)] →3 →6, and Numbers [(1 →2) or (9 →8)] →3 →5 →7 by the order of implementation as shown in Figure 4.7. In both (1 →2) and (9 →8), the Shuhachi-bosaikai considers the usefulness and importance of a hazard map by taking into account examples from other communities and dissenting opinions in the Shuhachi community. The three paths end at action component numbers 4, 6, and 7, respectively. The first action plan component path (ending at Number 4) shows that the Shuhachi-bosaikai management group creates education flip boards describing the need for a hazard map after collecting cases showing importance of a hazard map. The second action plan component path (ending at Number 6) demonstrates that the Shuhachi-bosaikai recognizes the need for selecting the main organization in the community for making the hazard map. The third action plan component path (ending at Number 7) determines the contents of

the hazard map with collaborative actions in the Shuhachi community as the path is connected to Number 10 (considering the contents of the proposed hazard map).

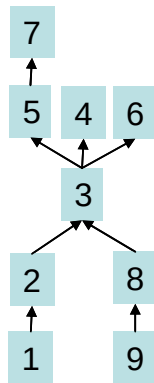


Figure 4.7 The order of implementation of action components for the management group (Shuhachi-bosaikai) within 3 months.

All paths of action plan components contain the Number 3 card (opening the Shuhachi-bosaikai meetings) as a common action component. The Number 3 action component card has a close relationship to many other action components. This means that to perform this action component is important in order to effectively carry out the action plan of the management group (Shuhachi-bosaikai). According to this, the management group should determine the strategic choice and focus its activities for making a hazard map on the action component of “opening the Shuhachi-bosaikai meetings,” which then becomes the core action component of the action plan. Therefore, through the ISM analysis, the core action component (Number 3) has been identified.

4.4 Conclusions

The Yonmenkaigi system method has been used for making a collaborative action plan for disaster risk mitigation at the community level. In chapter 4, the Yonmenkaigi system and its application to activities of self-governed community associations for disaster reduction (*jishubosai-soshiki*) are presented.

Members of the Self-governed Community Association for Disaster Reduction (*Jishubosai-soshiki*) in the Shuhachi community, Nakagyo Ward, City of Kyoto, Japan, developed an implementable collaborative action plan for their community through a Yonmenkaigi system workshop. The Yonmenkaigi system method provides a means to go from risk awareness to collaborative action plan creation for disaster reduction. Moreover, the Yonmenkaigi system method furnishes a useful

tool for enhancing local communities' disaster coping capacity and preparedness. Furthermore, following a disaster, the Yonmenkaigi system method can also be utilized as an assessment and feedback tool not only to review the effectiveness of a plan but also to update and revise existing plans for disaster reduction. The Interpretive Structural Modeling (ISM) method has been used to methodologically elaborate the action plan outcomes of a Yonmenkaigi system workshop. It helps study relationships of action plan components developed by participants in a Yonmenkaigi system workshop. A structural graph of action plan components is drawn. Furthermore, the core action component that has many links with other action components is identified which is the root to achieving the action plan.

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Chapter 5 Mutual Knowledge Development for Sand Mining Management in Local Community of Mt.Merapi using the Yonmenkaigi System

5.1 Introduction

Chapter 5 introduces the development of the Yonmenkaigi system for sand mining management as a participatory workshop method to improve everyday disaster response capacity within communities. The Yonmenkaigi system method is presented as a case study conducted by Gadjah Mada University, Indonesia, in collaboration with our research group at Kyoto University, under Urgent Disaster Reduction Project for Mt. Merapi, Progo River Basin (JICA Loan No.: IP-524) executed by Directorate General of Water Resources, Ministry of Public Works, Indonesia. This chapter will focus on one section of the project, titled “Study on Community Development at Mt. Merapi Area”. This sub-project consists of three components, namely "Pilot Project", "Evacuation Drill", and "Events". KU introduced the Yonmenkaigi system method program as a part of Pilot Project, which was agreed to include the facilitator build up program of the Yonmenkaigi system method to improve Pilot Project. This made us researchers from Japan to develop yet missing implementation knowledge such as how to revise and adapt the whole process of introducing the Yonmenkaigi system method to a new issue in a different country with a different culture and history–In this case, participatory management for sand mining-troubled communities in the Merapi Region, Indonesia.

Chapter 5 intends to first describe specifically the adaptation processes of introducing the Yonmenkaigi system method to the Merapi mountainous communities in sand mining management. Secondly, it intends to categorically itemize and formalize types of implementation knowledge needed for introducing the Yonmenkaigi system method to the cases in Indonesia. Development of such implementation knowledge is shown to be modeled as mutual knowledge development between “seed knowledge providers” and “customer knowledge providers.”

5.2 Project Description

Our research team from Kyoto University (KU) was asked to collaborate Gadjah Mada University (UGM) particularly in methodological application and workshop implementation. The seed knowledge provider in terms of introducing the Yonmenkaigi system method to the Merapi Region is KU, with UGM as its first hand customer. The end customer is considered to be a collection of local residents (community people participating in the project from Merapi Region). Implementation gap in knowledge is identified to exist on both ends, i) the seed knowledge provider and the first hand customer, and ii) the first hand customer and the end customer. Since customers, either the first or the second are expected to contribute to adding on knowledge from the viewpoint of customers, let us call them “custom knowledge providers”. In terms of implementing the Yonmenkaigi system method, the seed knowledge provider and custom knowledge providers should learn each other and fill in a gap of knowledge between them.

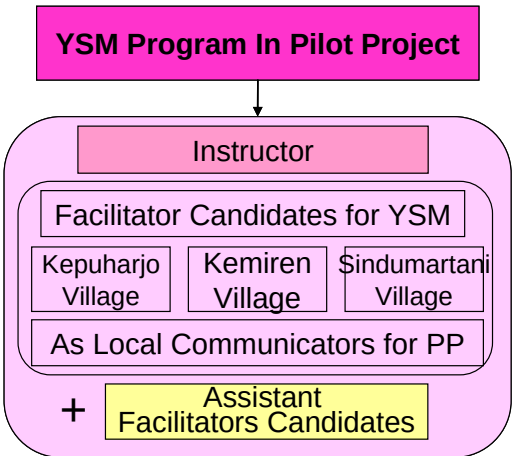


Figure 5.1 The Organization Chart of the Pilot Project of Gadjah Mada University

Obviously there exists a large implementation gap in knowledge between the seed knowledge provider and the end customer knowledge provider; knowing this, KU decided to gain access to local communities indirectly via UGM. Therefore the above two types of implementation gap in knowledge came into scope.

The first challenge for the project team in implementing the Yonmenkaigi system method was an issue of capacity build-up of facilitator expertise owners, i.e., how to mutually develop facilitators for the Yonmenkaigi system method.

That is, in order to fill in the gap at both ends, human development of facilitators as intermediate knowledge owners was intended to be challenged by the instructor (mainly the author) as an effective means. Here “intermediate” means bridging a gap and bringing something from both ends. Based on this premise, the members of the Pilot Project included the principal investigator,

facilitator candidates of the Yonmenkaigi system method and local communicators for each village as shown in Figure 5.1. To make up for some of the yet remaining gap uncovered by the facilitators, local communicators were selected from the UGM staff to collaborate with each village in the project. As stated later in detail they were asked to serve as both assistant facilitator and an active participant.

Considering a workable time schedule for training (building up) facilitators for conducting the method of Yonmenkaigi workshop, KU has proposed and implemented a training program for facilitators. They were requested to take up buildup programs with two steps, namely Step 1 (beginners version) and Step 2 (semi-advanced version). The Step 1 conducted to May from April in 2009, and then the Step 2 was conducted (facilitated and instructed about facilitation) for the period from June 1st to 3rd in 2009 by the author of this dissertation.

5.2.1 Illustrations: The Yonmenkaigi system method in Pilot Project

To elaborate on the aforementioned major points of our fine-tuning works to implement the Yonmenkaigi method, illustrations of the specifics of bringing in the Yonmenkaigi system method to a particular community are made in the following:

A special Yonmenkaigi system programs was developed and proposed to the implementation of the Yonmenkaigi system method in local communities, and the same was used in the facilitators training for UGM, respectively, as follows:

To produce a collaborative action plan to improve the sand mining management activity under the Pilot Project, firstly Workshop A and Workshop B using the Yonmenkaigi system method were planned as shown in Figure 5.2. The objectives of Workshop A are (1) to share the opinions of participants, as the representatives of each village, on their needs of sand mining management through free style discussions, and (2) to determine the outline of topics for the collaborative action to implementation of sand mining management at local community level. The objective of Workshop B is to follow up the Workshop A to make a collaborative action plan for each selected village using the Yonmenkaigi system method.

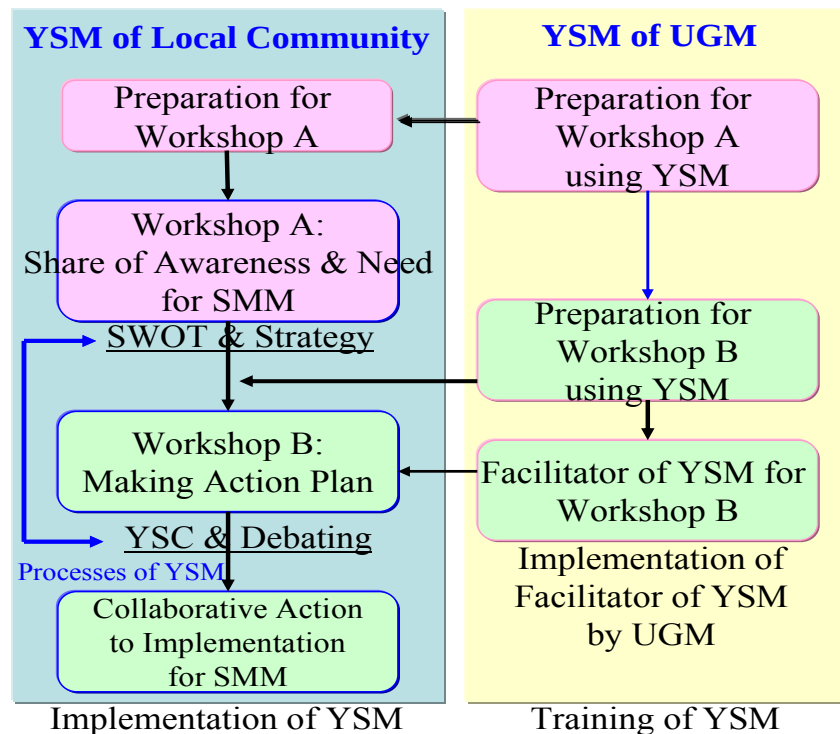


Figure 5.2 The progress of Workshop A and Workshop B using the Yonmenkaigi System Method (YSM) in Pilot Project

It is noted here that in order to introduce the Yonmenkaigi system method to the selected villages in Merapi Region, we needed to consider their local conditions (such as people's unfamiliarity with this type of workshop method, and cultural differences in communication and deliberations). This is why we decided to make the above-mentioned modifications on the standard procedures of the Yonmenkaigi system method, which have been commonly used in Japan by the authors and others.

In the following analysis, two more points are addressed. That is, someone has to serve as i) an instructor, and someone has to serve as ii) a facilitator and also a local communicator of the workshop.

As mentioned above, the author served as the instructor of the Yonmenkaigi system method. For this purpose "preparation workshops" were first introduced before the implementation of Workshop A and Workshop B by using the Yonmenkaigi system method. The objectives of these preparation workshops were (1) to instruct and train the facilitators of UGM for the Yonmenkaigi system method, and (2) to develop an instruction manual of Yonmenkaigi workshops for the facilitators in UGM. This manual includes the process and work descriptions for both the facilitator and organizer of Workshops A and B. The facilitators of UGM carried out Workshops A and B on August 11 and 13, 2009 according to the process and work descriptions.

5.2.2 Mutual knowledge development for facilitator training program of the Yonmenkaigi system method

We here analyze the above-mentioned additional human resource development from the viewpoint of mutual knowledge development to fill in an implementation gap identified for introducing the Yonmenkaigi system method into the target communities in Merapi.

To carry out effectively Yonmenkaigi workshops, questions were raised; who can offer such a communication skill to guide and coordinate the consistency and quality of collaborative actions among participants, who also shares essential knowledge and information on the respective local community, and also who has sufficient understanding of the Yonmenkaigi system method. The role model for such an integrated competence was decided to be called the facilitator of a Yonmenkaigi workshop.

Since in UGM there was none found to serve as facilitator, KU offered UGM a support to develop a facilitator build-up (training) program. This was the seed knowledge provided by KU, and UGM provided local knowledge needed for facilitators and also helped KU identify qualified candidates from their staff.

The purpose of Facilitator Training's Program of the Yonmenkaigi system method was to speed up and effectuate more systematically intended activities under the Pilot Project. In addition, there was a crucial need to improve the competence of facilitator candidates. Another challenge was to how to train facilitators to own virtually experience required for the facilitation of the Yonmenkaigi Workshop with local community people by going through the whole process of the Yonmenkaigi system method. The training procedures consist of the two steps, namely Step 1 as Beginner Program, and Step 2 as Semi-advanced Program as shown in Figure 5.3.

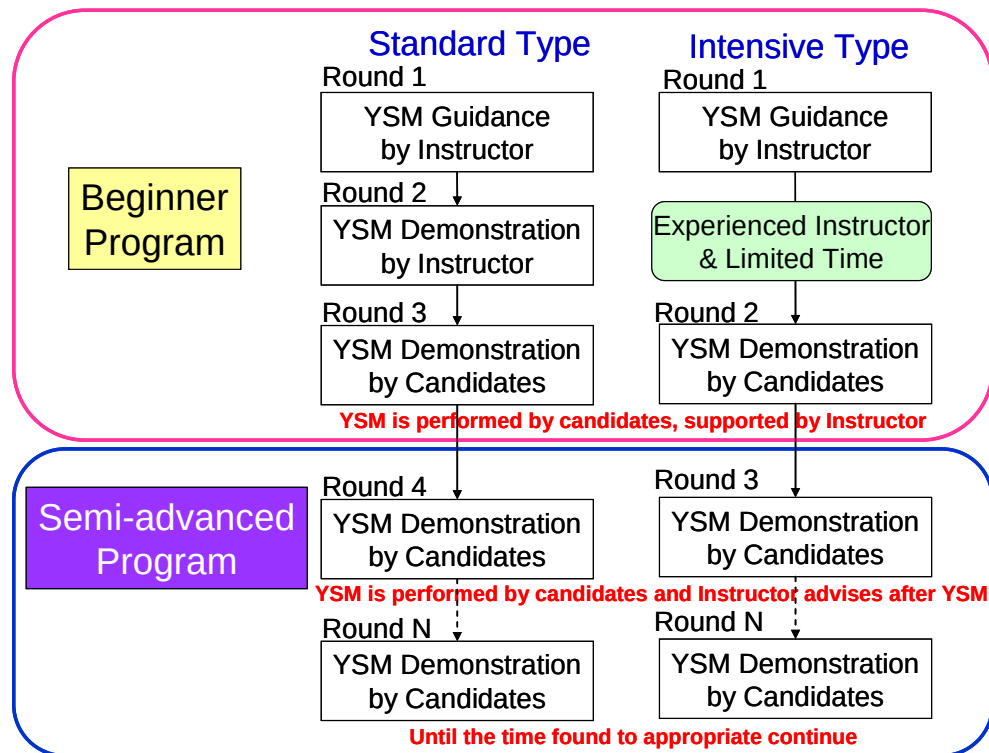


Figure 5.3 Facilitator Training Programs for UGM facilitator candidates in the Yonmenkaigi system method

The focus of training in the Beginner Program is to develop basic understanding of the processes of the Yonmenkaigi system method. The purpose of the Semi-advanced Program is to develop capacity to facilitate the Yonmenkaigi workshop as a facilitator, who is also trained to make a diagnosis by analyzing the current situation of local community. The facilitator candidate is also expected to have enough experience and capacity to understand and communicate smoothly with people in the local communities in Mt. Merapi. The facilitator is required to develop enough knowledge and recognition of the themes related to the Pilot Project's community issues. Beside the training practice of the Yonmenkaigi workshop, the KU-UGM survey team conducted a short interview combined with questionnaire survey regarding what the facilitator trainees found about both the significance and value of the Yonmenkaigi system method as well as its difficulties and deficits to be overcome. These data were collected to analyze how to make Yonmenkaigi workshops better conducted by considering the local specifics of the Merapi community participatory cases.

Thereafter thus, trained facilitators of Pilot Project of UGM carried out the implementation of a participatory workshop in the selected communities for sand mining management by using the Yonmenkaigi system method. For this purpose, participants of local communities related to Pilot Project created the action plan to carry out Yonmenkaigi workshops for sharing the need of sand

mining management and to clustering ideas to implement sand mining management of local community level by using the Yonmenkaigi system method in August 2009. As shown in Fig.1, the Yonmenkaigi system method was implemented in three villages, namely Kemiren, Kepuharjo, and Sindumartani in Mt. Merapi region. In the following analysis, this paper focuses the implementation of the Yonmenkaigi workshop in Kemiren village case, conducted on August 2009.

5.3 A case study of the Kemiren Yonmenkaigi Workshop

5.3.1 Kemiren Village

Kemiren village is located at the south west part of Mt. Merapi slope. Administratively it is a part of Srumbung District, Magelang Regency local government area of Central Java Province. Kemiren village is officially bordered by Ngablak village on its northwestern side; Hargobinangun village and Kaliurang village on its southeastern side; and Kamongan village on its southwestern side. Kemiren village is divided into three Dusun (Sub-village) namely; Dusun Jamburejo, Dusun Kemiren, and Dusun Kamongan Cilik. Kemiren village has 1,141 people and 307 households as of 2007 over area of 487.629 ha, as shown Figure 5.4.

The structure of village administration is the same for the whole of Indonesia only the number of civil servants and the members of the village council are dependent on the character and the size of the village. Located at the right side of Kali Batan's upstream area, the villagers are depends mostly on Salak farming which is irrigated by water from Kali Batan. Almost 60 % of the inhabitant working as Salak farmer, only 6 % work in rice field in where used to be the sand quarries. The rest are working on informal sector.

As the same as other parts of Mt. Merapi areas, the land consists of sandy fertile soil. Even the land has sand mined product potential, sand mining activities not became major occupation in this village since the Salak farm was able to earn higher income for the villagers. Yet small sporadic and localized sand mining activities in Kemiren village and its surrounding areas have also been developing since 1990s.



Figure 5.4 Kemiren Village in Mt. Merapi, Indonesia (edited from <http://maps.google.co.jp/>)

Massive sand mining activities started in Kali Bebung, upland Kemiren village from year 2000 after the Mt. Merapi eruption. From that time, the sand mining activities began to use excavator equipments and to involve more than one thousand number of trucks. Most of the sand mining company and its workers comes from Temanggung District and Wonosobo District, out of Magelang District. Since the sand mining activities forced them to work long each day, the workers built a semi permanent barrack around the sand quarry to stay during mining activities, As mining industries increased, several sand depots (sand storages) were developed within Kemiren village by either land's owners or land tenants (Study Center for Engineering Science Gadjah Mada University and DPRI, Kyoto University, 2010).

The main problem of sand mining activities in Merapi may be described as follows:

- (i) Active volcanic eruptions may cause disasters but also provide a massive volume of sand resources for construction materials and others to be mined from across valleys susceptible to volcanic risks, thus making sand mining industries more economically activated. Therefore, the sand mining has become an important income source for local people in the Merapi region.
- (ii) Intensive and uncontrolled sand mining activities tend to cause non-registered sand miners grow in number, and results in increased improper excavation, and pollution and accidents due to heavy traffic, etc., (Yachiyo Engineering Co., Ltd, 2009).

In fact villagers were troubled more and more by the increasing of mining activities and traffic of including trucks and sand miners mobility passing through the village as well as expanding activities in sand depots for loading and unloading of excavated sands from local mines mined. Noise pollution and several crime incidents have been reported by the villagers as the bothering impacts of both sand mining activities in Kali Bebung and sand depots in their neighbourhood.

In order to minimize such sand mining impact by themselves, the villagers resorted to a village's organization, Bumi Lestari meaning "Eternal Earth" in Java language. Thus villagers intended to collaboratively work with the government and sand depots' owner as well as mining companies. It was intended to localize the sand depots to some proper place.

5.3.2 Implementation of the Kemiren Yonmenkaigi Workshop

Why the Yonmenkaigi system method was introduced in Kemiren village? The major reasons are:

It was intended to work out some modest initiative that can be taken by each respective community, and involvement of the mining company to resolve conflicts between Kemiren community and sand miners was not challenged. In stead, the main purpose of the workshop in Kemiren community was agreed to develop a collaborative action plan in a participatory manner so as to improve roles and activities of Bumi Lestari, thus reducing the sand mining impact to their maximum capacity. The fatal lack of capacity on the side of the community people was their inability and inexperience to systematically and logically make a sound diagnosis of the current state of their community and to work out a collaborative action plan so as to achieve their own goal.

Therefore, the Yonmenkaigi system method is the suitable participatory workshop method to improve the activity of sand mining management in local community. Importantly the Yonmenkaigi also provides a communication basis for working together by having all seated together around a square table and by brainstorming about each other's views. This strengthens effectively the sense of mutual trust and knowledge ownership as they engage themselves in a collective and collaborative action planning (Na, Okada, and Fang, 2009).

For the reasons above, the Yonmenkaigi workshop was organized in the name of Bumi Lestari in order to lead the survey plan in Kemiren village on August 19, 2009. As the initiator, Bumi Lestari was interested in developing an action plan for conducting a survey of the traffic of Armada (trucks) passing Kemiren village. Bumi Lestari as the community institution in Kemiren village determined the topic of conducting a survey of sand trucks for those passing Kemiren village. 13 participants plus 5 facilitators were involved in the Yonmenkaigi workshop process. Participants of

the Kemiren Yonmenkaigi workshop are from Kemiren village, comprising the member of Bumi Lestari (5 people), Karang Taruna (Local Youth Organization) (2 people), and village government staff (6 people) as shown in Figure 5.5. Participants represented most of concerned parties in Kemiren village except for the sand miners coming from outside.

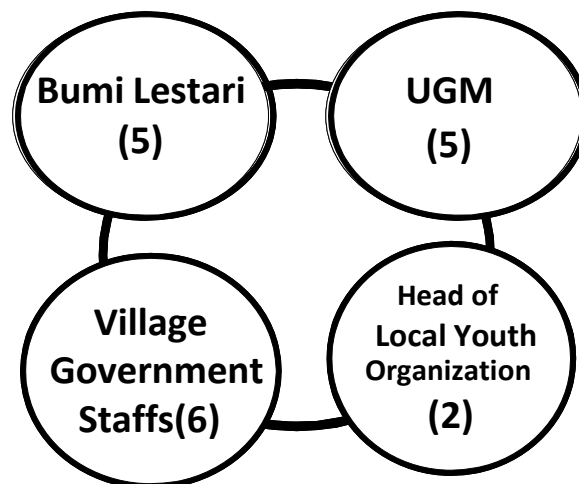


Figure 5.5 The Identification of Participants in Kemiren Workshop

5.3.3 Preliminary groundwork before the Yonmenkaigi workshop

One main facilitator and four sub-facilitators as both participants and members of Pilot Project team in UGM in each group were selected and engaged to promote the process of the Yonmenkaigi system method. The Kemiren communicator of UGM, who served as the main facilitator, As described before, he was then asked by the KU-UGM project team to serve as the main facilitator. He explained and introduced to the participants the rules and methods of the Yonmenkaigi workshop, thus facilitating the whole process. The KU-UGM project team advised that the Yonmenkaigi workshop should be designed to last for two and half hours, considering the time constraints and limit of enduring process for local participants from Kemiren village. For the purpose of documentation and following analysis, the process was recorded by one keeper of records and one cameraman.

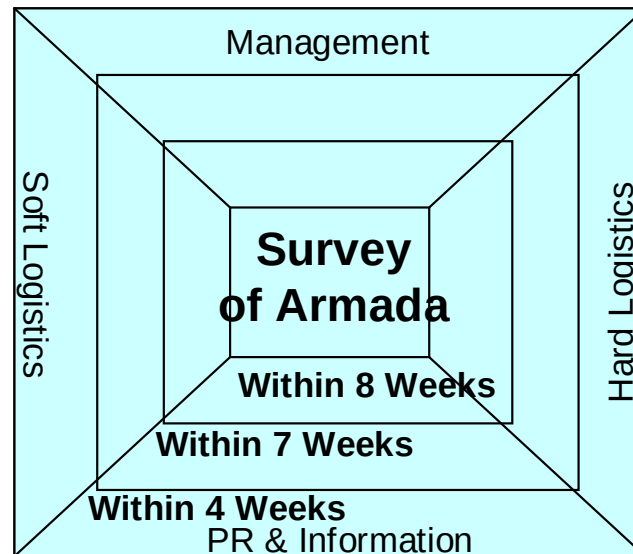


Figure 5.6 The Time Frames and the Roles of the Kemiren Yonmenkaigi Workshop

To set a framework for collaborative action planning, both the long term and short term scenarios of sand mining management for Kemiren village were explained to the participants on August 19 by UGM based on the results of the discussions which had been conducted beforehand within Bumi Lestari as guided by UGM. The SWOT results of the Workshop A organized on August 11, 2009 were used to assist the participants in carrying out the SWOT analysis for the case of Kemiren Village. The participants decided that the main theme of collaborative action linked to implementation in the Pilot Project was to survey traffic conditions of sand trucks in an area of Kemiren village. They selected a two-month period from September to October 2009 as a realistic time frame for achieving the goal. This assessment was overall made by considering the following.

a) It is necessary to collect sufficient information about the mobilization of sand trucks. b) This information will be used to determine both the proper place of sand depots and depot's capacity needed. Based on the results of the SWOT analysis, the following strategy was compiled as shown in Table 5.1.

Table 5.1 Main theme set through SWOT analysis in Kemiren village

Main Theme	Survey of Armada traffic (sand trucks)
Objective	To count the number of sand and gravel trucks and To measure the sand height in trucks from mining sites in Bebeng river, and passing through Kemiren village in a week
Time	2 months (from plan to its implementation)
Target	Armada (sand trucks passing through Kemiren)
Executor	LPSPD BUMI LESTARI

From the 17 participants, each of four groups was formed to play the roles of management, PR & information, soft logistics, and hard logistics, respectively. In other words the corresponding responsibilities of the four groups were top-management, communication to other organizations related to the theme, human resources, and physical resources; thus each of them working collaboratively to achieve the main theme (topic)/goal of the workshop as determined in the earlier process.

With the above-mentioned preliminary groundwork, the Kemiren-tailored Yonmenkaigi workshop was conducted by following basically the standard procedures of the Yonmenkaigi system method, that is (1) SWOT analysis; (2) defining the main theme based on SWOT analysis; (3) working on Yonmenkaigi chart; (4) debating to improve the consistency and quality of collaborative activity; (5) final presentation of action plan. Note that the whole processes of the Kemiren-tailored Yonmenkaigi workshop was divided into two stages, one that deals with SWOT analysis and the second that deals with making the collaborative action plan.

The goal of this collaborative action is to know the number of sand and gravel trucks and the rate of sand transportation per week to its destination (collection and distribution depot) from mining sites in Bebeng River passing through Kemiren village. The target of a survey is the trucks of Armada passing through Kemiren village. The funding source for survey implementation is decided to come from both Kemiren village and Bumi Lestari. It also decided that the survey including the preparation and data entry will be conducted during two months (September – October 2009). The time frames and the roles of actions considered in the Kemiren Yonmenkaigi workshop are shown in Figure 5.6 as within 4 weeks (September 2009), within 7 weeks (October 2009), within 8 weeks (end of October 2009). In the end of the action plan (end of October 2009), a workshop will be held to announce the result of survey to related parties and to prepare the follow up plan.

After some revisions of action components among each group during debating, the action plan of the Yonmenkaigi chart as shown in Figure 5.7 was completed .



Figure 5.7 Picture of the Yonmenkaigi chart after debating of the Kemiren Workshop.

5.3.4 Analysis of Collaborative Action Development during Debate

In the Yonmenkaigi workshop method, cards are used by participants to express and exchange views and ideas during the debating phase. During the debate stage, the multi-level knowledge development process of the debating practice is reflected through card movements. For analytical purpose, several basic rules (see Figure 3.10) for the movement of cards as can be retrieved from the recorded data (snapshots made in the due processes) have been identified as follows:

- 1) Add a new card: a new action component has been identified. During the Kemiren Yonmenkaigi workshop, for example, the groups playing the role of soft and hard added new action component cards of “Making survey format” and “Survey on trucks”.
- 2) Move a card: the action component is more suitable or preferable to the group the card moved to rather than to the original group.
- 3) Delete a card: the action component is no longer needed or desirable.

4) Arrange cards: cards are arranged and grouped by considering the time frames of the action components. For example, an action component card related to survey of Armada in management group was shifted from within 4 weeks to within 7 weeks in the same group.

5) Collaboration shifts of cards: some action components may require collaboration among more than one group. This indicates that the groups concerned or overlapping groups will work together on the same action plan component. Because each of the groups has its own limitations, some action plan components require collaboration across the groups to manage the action plan components more synergistically ^[4]. During the Kemiren Yonmenkaigi workshop, the action component card of “developing the contents required in survey of Armada”, the card of “meeting with related government agencies in preparation stage of field activity”, and other 22 cards in the management group were moved to the border zones between the management group and the other groups. It was noted, for instance, by participants that Kemiren village needs to work together with other stakeholders to implement these action components because its own capacities are limited.

In the Kemiren Yonmenkaigi workshop, as shown in Table 5.2, the four groups, i.e., management, PR & information, soft logistics, and hard logistics first presented 40, 25, 22, and 29 action component cards, respectively, or a total of 116 action cards placed on the Yonmenkaigi Chart before debating. After debating, the numbers of action component cards increased to 41, 33, 31, and 34, respectively, or a total of 139. In Table 5.2, the cards of collaboration (shifts) are counted in each of the collaborating groups.

Table 5.2 Action Plan Components before and after Debate

	Management (M)	PR & Information (I)	Soft Logistics (S)	Hard Logistics (H)
Before debate	40	25	22	29
Changes to action plan components after debate				
Arrange	1	2	1	1
Add	0	0	1	1
Move	0	0	0	0
Delete	0	1	0	0
Collaborate	23	6	13	2
No change	17	24	16	30
Total	41	33	31	34

The above discussions show that movements of cards and debating process by use of the Yonmenkaigi Chart systematically lead to mutual knowledge development for collaborative actions. This type of mutual knowledge development is generated from within the participants together with

from the formulated procedures for performing the Yonmenkaigi Chart-based deliberations. Such knowledge generated and owned by participants are outcomes of the implementation of the Yonmenkaigi system method. It is therefore categorically different from the already mentioned types of mutual knowledge development for filling in missing knowledge for implementation. The former is “the outcome of implementation,” whereas the latter is “the knowledge development for setting a communication platform.” This kind of knowledge development is needed for actually practicing a Yonmengaigi system method workshop.

For complementary discussions, we will here take up a little bit more the latter type of knowledge development. Complementary Discussion: Development of Knowhow on Setting for Implementation

Throughout the process of implementation of the Yonmenkaigi system method in local communities in Mt. Merapi, there were two organizational developments findings which are considered development of knowhow on setting for implementation: (1) mutual knowledge development between KU-UGM and local communities, and (2) a new style of facilitation in the Yonmenkaigi system method.

5.3.4.1 Mutual knowledge development among multi-stakeholders

There were knowledge gaps between KU, UGM and local communities to implement Yonmenkaigi workshops for sand mining management in local communities.

For example, KU has the knowledge of the Yonmenkaigi system method but did not have enough knowledge of local communities as basic information for development of collaborative action plan of sand mining management in the selected local communities; KU also does not own a human network or the knowledge of human networking to involve the respective local communities in Mt. Merapi. UGM has already built good relationship and experienced with the local communities in Mt. Merapi, therefore UGM owns basic information about them. However, UGM did not have the knowledge of participatory workshop methods, such as the Yonmenkaigi system method, and did not have enough facilitation knowhow for the development of collaborative action plan at local community level. Local community people have knowledge of communities’ problems in sand mining management, but they did not have the knowledge of participatory workshop method.

It is remarked that in order to solve the knowledge gaps between them, each of the stakeholders shared and combined their knowledge considering the strengths and the weaknesses of KU, UGM and local communities.

Mutual knowledge development could be achieved through the implementation of collaborative action plan in sand mining management in local communities by exchanging the knowledge owned by each stakeholder (KU, UGM, and local communities), as shown in Figure 5.8.

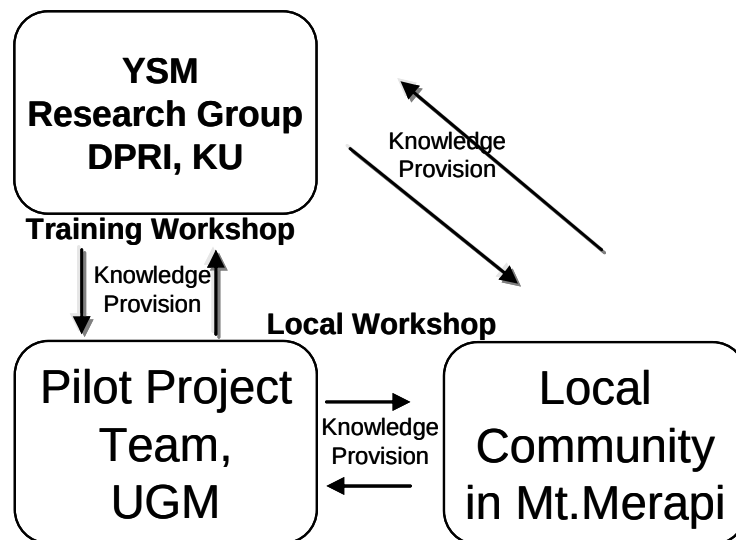


Figure 5.8 Mutual knowledge development of each stakeholder in implementation of Yonmenkaigi workshops

Other than the mutual knowledge developed between those three stakeholders, we also found the mutual knowledge developed internally among the members of UGM. By conducting the Yonmenkaigi system method to prepare Workshops A and B, the members of UGM could create the task demarcation document as a communication tool to understand internal information flow among them.

5.3.4.2 A new type of facilitation in the Yonmenkaigi workshop considering local context

A new type of the Yonmenkaigi workshop facilitation was proposed in order to implement the Yonmenkaigi system method in Mt. Merapi communities, considering the local situation. The typical facilitation of the Yonmenkaigi workshop, which is facilitated by one facilitator, was modified by adding the sub-facilitators into each group. Therefore, the new type facilitation consists of one main facilitator and four sub-facilitators as shown in Figure 5.9.

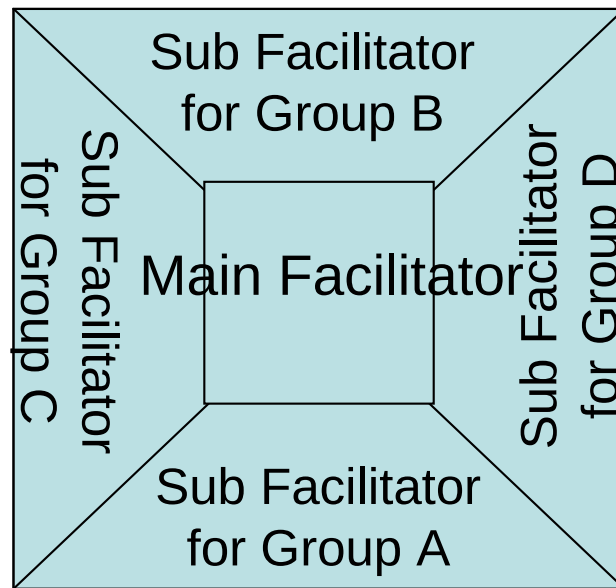


Figure 5.9 A new type of facilitation in the Yonmenkaigi workshop for Mt. Merapi community

The following explains how we came to develop this new facilitation system. This is the process of mutual knowledge development to bypass a gap in implementation existing between the seed knowledge provider and customer knowledge providers.

With a view to effectively introducing the process of facilitation, given yet relatively non-matured level of facilitator's experience and competence, we decided to add a supplementary role to that of facilitator. The new role is named sub-facilitator, who is expected to accelerate the procedure in the Yonmenkaigi workshop by supporting the main facilitator and guiding participants of each group. This role is important since there are gaps in social strata, education level including literacy and oral communication capacity to communicate in the standard Indonesian language, and level of familiarity with formal discussions among the participants in local communities. Thus the role of sub-facilitator is considered effective, particularly when main facilitator does not enough experience or competence to lead alone in the Yonmenkaigi workshop.

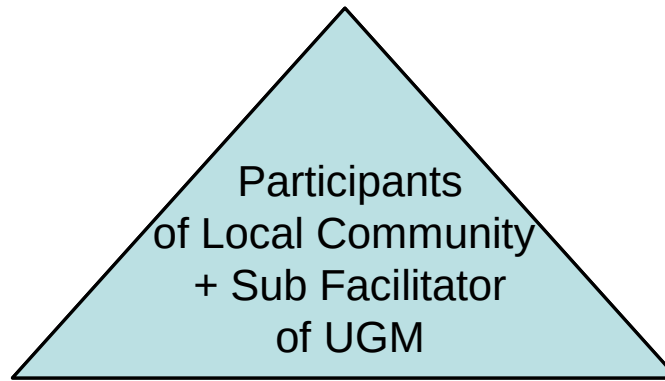


Figure 5.10 A structure of each group in Yonmenkaigi workshops for Mt. Merapi community

The local communicator of UGM in charge of Kemiren village who was selected from the UGM staff acted as the main facilitator, and four other facilitator candidates acted as sub-facilitator assigned to each group in the Yonmenkaigi workshop. The roles of the sub-facilitator included both that of assistant facilitator and that of a participant assigned to the group from Merapi communities as shown in Figure 5.10.

Sub-facilitators in the Kemiren Yonmenkaigi workshop helped to write down action components when the participants expressed their ideas and opinions and to record action plan items of their group, also to explain to their community participants the roles of the group as well as the rules and procedures of the Yonmenkaigi system method in detail. Thus, they are expected to make up for main facilitator's role and also to softly guide their community participants by capitalizing on their knowledge of their local conditions and specifics.

5.4 Conclusions

The Yonmenkaigi system method has been utilized for developing a collaborative action plan for sand mining management for disaster risk mitigation in Mt. Merapi communities. The participants of Kemiren village in Yogyakarta, Indonesia produced what participants agreed to be an implementable collaborative action plan for their village through the Yonmenkaigi system method.

Two types of knowledge development have been specified as instrumental for introducing the Yonmenkaigi system method to the cases in Indonesia. The first type of knowledge development is that type of knowledge which is generated as an outcome through the process of implementing a whole set of the Yonmenkaigi System. The second type has been modelled as mutual knowledge development between “seed knowledge providers” and “custom knowledge providers”.

A few more notes are made to consolidate our points.

The first type of knowledge development is considered to occur during the process of practicing a Yonmenkaigi workshop. This type of mutual knowledge development takes place among participants of the workshop, including facilitators and sub-facilitators. Knowledge acquired include the process-dependent knowledge generated and the outcomes of the collaborative action plan. A particular challenge during this phase is working together to make a common diagnosis and developing a collaborative action plan that is owned and committed by the participants. The knowledge is largely dependent on specifics of the areas targeted, themes selected, and participants involved. The second type of knowledge development is concerned primarily with knowledge needed for setting up an appropriate communication platform to operate a Yonmenkaigi workshop. Such knowledge development should be made before a Yonmenkaigi workshop is actually practiced in the target communities from the Merapi region. The knowledge developed may well be more commonly transferred to other areas in the Merapi region, or even beyond it, probably to other regions and other themes than for instance, volcanic disaster reduction.

In both types of knowledge development, it is important to note that they are achieved not merely through successful events but also through “seemingly failed” events that yield valuable information. For instance, it has been learned through communication failures caused by neglecting a considerable level of educational and literacy gap between what the standard version of the Yonmenkaigi system method takes for granted and what is actually the case with average community people in the Merapi region. This problem may be further explored by introducing the notion of “communicative rationality” (Judith, Innes, and David, ,1999).

Seed knowledge providers and customer knowledge providers may be reinterpreted in other words as “prosumers”(Alvin Toffler, 1984). In this manner we can probably study the process of filling up an implementation gap as that of mutual knowledge development among “prosumers”.

Systematic documentation and formalization of the knowledge developed was a primary concern of our research but it is fair to mention that any kind of knowledge development has to entail much of implicit knowledge and wisdom that may defy analytical attempts. It is also subject to any further change and evolution as further trials are continued to be made.

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Chapter 6 The Sandankai System

6.1 Introduction

Participatory workshop methods for increasing local disaster reduction capacity were initiated to afford disaster education in Japan communities [4]. In order to improve relief, response and recovery processes in a local community after the impact of a disaster, it is necessary to create realistic disaster scenarios and develop collaborative action plans. Risk awareness should lead to actions that can be implemented to improve the capacity of the local community in coping disasters. Workshop methods can be utilized to develop more effective action plans at the community level that include risk communication techniques among residents for the community's disaster relief, response and recovery.

This chapter presents the result of a case study carried out in the Samcheok High School, City of Samcheok, and Gangwon Province, South Korea, which incorporated an adaptation of the Sandankai system workshop. The Sandankai system has been used for disaster education to improve risk communication at the community level. This chapter also focuses on the integration of the Sandankai system and the Yonmenkaigi system for integration of disaster risk management both for pre-disaster and post-disaster.

6.2 The Sandankai system method for development of disaster scenarios and action plans as a participatory workshop method

Most current participatory workshop methods for disaster reduction in Japan focus on personal rescue and relief activities immediately after a disaster, rather than on response and recovery actions medium to long term after a disaster. The general objective of a participatory workshop is to provide a forum for residents to share risk awareness and to communicate with others. During these workshops, facilitators determine the disaster scenarios and the roles and responsibilities of community participants. As a result, these workshop methods are unable to adequately reflect the view of local communities. A workshop facilitator considers a hypothetical situation rather than the local context.

The Sandankai System Method has been proposed to develop disaster scenarios and collaborative action plans for improving relief, response and recovery capacity in communities as a participatory workshop method. The Sandankai Method was originally designed and used to create disaster scenarios and to develop collaborative action plans to improve disaster response capacity in a

mountainous municipality of Chizu Town, Tottori, Japan (Na and Okada, 2009) as shown Photo 6.1.



Picture 6.1 Sandankai system in Yamasato area of Chizu-cho (December 23, 2008)

The Sandankai System Method has two objectives. First, knowledge and information are obtained from each participant to understand the risk situation of a local area. Second, disaster scenarios and collaborative action plans at the local community level are developed. Participants learn more than improved risk awareness and enhanced communication. Collaborative activities by local people are a necessary element in improving disaster recovery capacity in local communities.

6.2.1 Overview of the Sandankai Method

The goal of the Sandankai Method is to develop disaster scenarios and action plans for local communities through workshops with a disaster risk context. In order to achieve the objective, the method focuses on the development of a plan chart with three time-phases: within 1 to 2 days after a disaster as the relief period, within 1 to 2 weeks as the response period, and within 1 to 2 months as the recovery period. For each time-phase, disaster scenarios and planned actions for the disaster scenarios are developed.

Participants of the Sandankai Method first define the disaster situation based on their experiences and information on potential risks to the local community. Disaster scenarios and action plans are then created for the three time-phases of relief, response, and recovery after a disaster. The basic features of the Sandankai Method are summarized in Table 6.1.

Table 6.1 Basic Features of the Sandankai Method

Application	Disaster scenario workshop
Objective	Develop disaster scenarios and action plans for enhancing the local community's post disaster coping capacity
Who Decides Scenarios	A facilitator suggests guidelines and participants determine scenarios and planned actions
Participants	Residents from the local community
Facilitator	Specialists
Typical Size	One Team (6 to 30 people); Three Groups (2 to 10 people each)
Outcomes	Disaster scenarios and action plans for the local community

A Sandankai Method workshop provides a multilateral communication platform. Participants enhance risk awareness and perception of collaboration through face to face communication. In this workshop method, the process of creating disaster scenarios and action plans is carried out by participants themselves. Other workshop methods lack this type of system (Na, Okada, and Fang, 2009). The emphasis of the Sandankai Method is on management of relief, response and recovery processes rather than on personal relief after a disaster. In the Sandankai Method, participants serve in the roles of both personal and local communities as subjects of the action plans.

6.2.2 The Process of the Sandankai Method

The process of the Sandankai Method has the following main steps: defining the major premises of the disaster situation, developing disaster scenarios and planned actions by completing a Sandankai chart, collaborative discussion in each group, and presenting each group's disaster scenarios and planned actions, as shown in Figure 6.1.

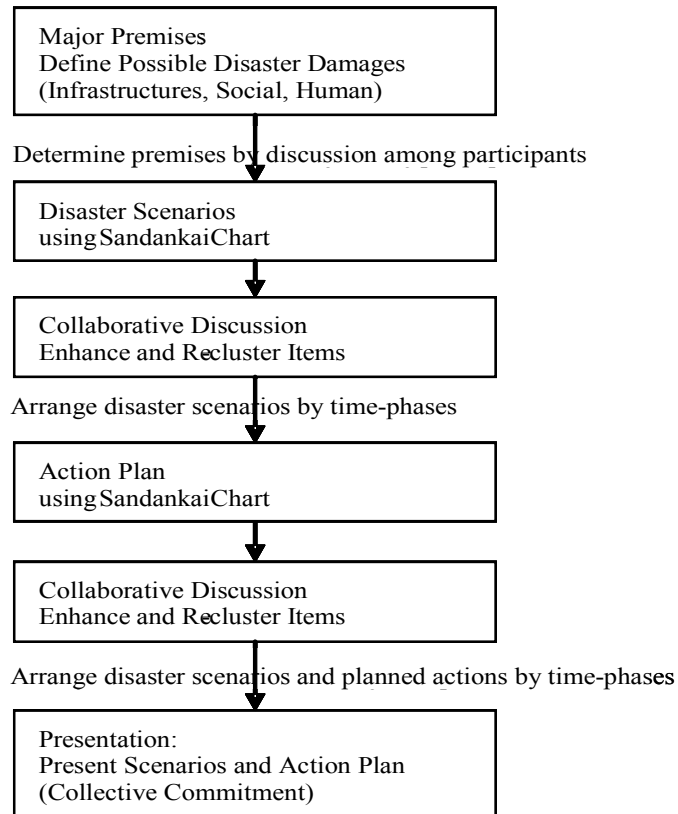


Figure 6.1 Process of the Sandankai System Method.

The Sandankai Method workshop starts with defining the major premises of the disaster situation. This step provides participants with an opportunity to share their information and experiences about the potential disaster risks of the community. During this step, the participants define the disaster situation and complete a table summarizing the major premises, including possible damages to infrastructures, human, and houses and the necessary recovery time from each damage, as shown in Table 6.2.

Table 6.2 Major Premises of the Disaster Situation in Samcheok City

Contents	Damage Situation and Necessary Time to Recover
When	Around the end of Summer (Typhoon Season)
Electricity	Within two weeks
Water Supply	From one week to one month
LNG Gas	Rural Area uses LPG (not LNG)
Communication	Within two weeks
Roads	Within two days (two months for some roads)
Human Injury	Some people injured
Houses	Shelters (within one week, could last more than one year)

Taking into account the disaster risks of the community, participants and facilitators are asked to imagine a realistic situation. The participants are then divided into three groups and each is assigned one of the three time-phases: within 1 to 2 days as the relief period, within 1 to 2 weeks as the response period, and within 1 to 2 months as the recovery period. Once the groups are formed, participants discuss disaster scenarios in accordance with their assigned time-phases by utilizing color cards on a specially designed chart called Sandankai Chart on large sheets of paper (788 mm × 1091 mm), as shown in Figure 6.2. Through collaborative discussion among groups, scenario component cards are moved to the group chart of the suitable time-phase. Moreover, participants develop planned actions for the scenarios considered within the three processes of relief, response, and recovery for disaster reduction, to complete a Sandankai Chart. The disaster scenarios are arranged on the up-side and the action components are displayed on the down-side of the Sandankai chart. Participants discuss the scenarios and the actions of their assigned time-phases.



Figure 6.2 Standard Patten of the Sandankai Chart

Once each group completes the articulation of scenarios and action components, collaborative discussion among members of each group is carried out to enhance the realistic disaster scenarios and the collaborative action plan. Finally, each group presents its scenarios and action plan.

The Sandankai Method features the views of both individuals and local communities, and the threats to relief, response, and recovery processes for local communities after disaster events. Participants determine their disaster situation assisted by the guidance of a facilitator. This is compared to current workshop methods of disaster reduction as shown in Table 6.3.

Table 6.3 Features of the Sandankai System

Current Methods		Sandankai System
Relief activities at one point of time within one or two days after a disaster event.	Disaster Scenarios and Actions	Relief, response, and recovery processes after a disaster event: ·within 1 to 2 days, ·within 1 to 2 weeks, and ·within 1 to 2 months
Mainly personal view for relief actions	Viewpoint for Actions	Both personal and local community views for relief, response, and recovery actions
Disaster situation proposed by facilitator	Who determines disaster situation?	Disaster situation determined by participants and facilitator

6.3 The Samcheok High School Case Study

6.3.1 Disaster Prevention at the Local Community Level in Korea

The Super Typhoons RUSA and MAEMI that occurred in 2002 and 2003 killed 246 and 117 people, respectively, in Korea. The economic loss estimated at USD 4.5 billion caused by RUSA is the highest in Korean history as a result of a natural disaster. In June 2004, the National Emergency Management Agency (NEMA) in Korea launched full activities for disaster prevention nation wide including government agencies and local communities. The Government of Korea has organized Citizen Corps Active in Disaster (CCAD) to support disaster reduction activities at the local community level since 2005. However, the main activities of CCAD are the development of rescue activities based on members' disaster experiences without a systematic disaster education program on disaster mitigation and preparedness. As well, schools do not have disaster education programs using participatory workshop methods for improving risk awareness.

6.3.2 City of Samcheok and Natural Disasters

The City of Samcheok, located in the Province of Gangwon, Korea, has a vulnerable road network, due to a precipitous mountain and a large city. It has both an urban and a rural residential area. As of January 2010, there are 71,453 residents covering an area of 1,185.8 square kilometers, 89% of which is forests and fields. Typhoon RUSA passed through Korea in 2002, which killed 246 people and caused an estimated USD 4.5 billion damage. In the City of Samcheok, 45 people were killed

and economic damages were estimated at USD 423 million. The City of Samcheok has had a Citizen Corps Active in Disaster (CCAD) for disaster reduction planning since 2006. The local government of the City of Samcheok is interested in disaster reduction planning because of its disaster experiences. A teacher from the Samcheok High School who is currently a PhD student in the disaster prevention department of a local university coordinated the Samcheok High School Sandankai workshop.



Picture 6.2 Damages of Gangwon Province by The Super Typhoons RUSA in 2002
(from http://isearch.sunchon.ac.kr/user/4th/user1151/tp_korea/p2-4.htm)

6.3.3 The Samcheok High School Sandankai Workshop

Students of the Samcheok High School were interested in developing disaster scenarios and action plans for relief, response, and recovery activities in their community for the flood disaster situation. Accordingly, the Samcheok High School Sandankai Workshop was conducted in the City Samcheok on December 23, 2009. Thirty students participated in the Sandankai workshop, which lasted two hours. The author of this dissertation, who served as the facilitator, provided guidance about the rules and methods of the Workshop to the participants.

The participants were divided into three groups of 10 each to develop scenarios and action plans for both himself and the local community. Through the step of determining major premises, as shown in Table 6.2, the participants found that there is no recorded information regarding how much flood damage the local community sustained in the Typhoon disaster of 2002. Therefore, participants decided the topic of the workshop would be to develop scenarios and action plans for the community for recovery activities from flood disasters based on their disaster experiences of 2002. As shown in Figure 6.3, the goal of each of the three groups is to create the disaster scenarios and action plans for relief, response and recovery processes, respectively, for the local community

based on the disaster situation determined by participants in the major premises step. The timeline of the Samcheok High School Sandankai Workshop is shown in Table 6.4. The time-phases for the disaster scenarios and action plans consist of from 1 to 2 days, from 1 to 2 weeks, and from 1 to 2 months.

Table 6.4 Timeline of the Samcheok High School Sandankai Workshop

Time actually spent	Contents
10:45 ~ 10:50	Greetings - Open the Workshop
10:50 ~ 11:05	How to use the Sandankai method?
11:05 ~ 11:10	Divide into groups and determine group leaders
11:10 ~ 11:30	Premises of disaster situation (based on personal experience)
11:30 ~ 11:50	Create disaster scenarios using the Sandankai Chart (What is our situation?)
11:50 ~ 12:30	Develop action plans using the Sandankai Chart (What should we do?)
12:30 ~ 12:40	Present and determine components that can be done in an action plan
12:40 ~ 12:50	Complete a questionnaire
12:50	Commitment and taking of photos

Although the participants were young at the time of disaster, they were able to remember their experiences, including very detail situations. Their knowledge was limited at the time of disaster. However, during the discussion for determining the major premises, they were able to share and integrate their knowledge and information about the disaster. Despite they had never expressed their experiences before this workshop, the participants created many cards of good idea for scenarios and action components during the workshop.

During the Samcheok High School Sandankai Workshop, some of the issues discussed were:

- 1) Disaster scenarios were identified for the Samcheok community.
- 2) Students of the Samcheok High School first shared their experiences to more easily visualize disaster situations, and then, expressed their scenarios and action plans for the local community.
- 3) The participating students recognized that they can help other people to respond to and to recover from flood disasters themselves because they are no longer young children.
- 4) The students asked teachers and community organizations to take collaborative actions and to implement their action plans together at the community level.

5) The need for collaborative action for disaster reduction in the Samcheok community was recognized by students through the process of brainstorming for scenario generation.

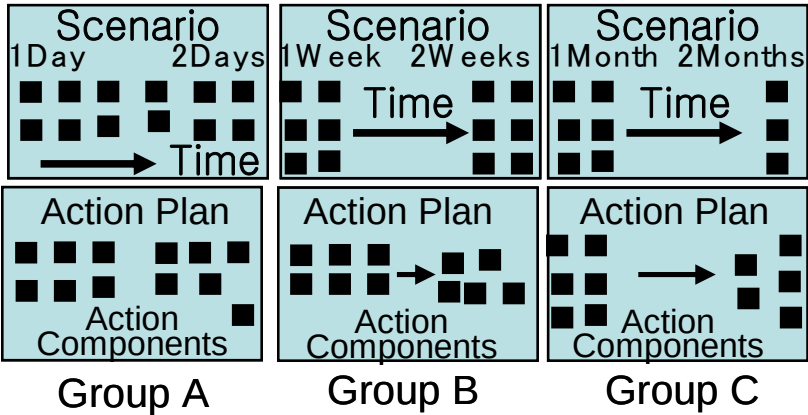


Figure 6.3 The Sandankai Chart of the Samchoek High School Workshop

To discuss disaster situations among all participants, the facilitator asked the participants to share their personal experiences of the disaster situation in 2002. Through the interactive communication process of questions and answers among participants and the facilitator, participants shared images of the flood disaster situation in not only static data like rainfall and Typhoon wind speed but also the real situation of each local community in the City of Samcheok. Participants set up a disaster situation based primarily on their experience of the Super Typhoon RUSA in 2002, when these students attended elementary school. Through this process, participants shared their disaster experience and could imagine detailed disaster scenarios and determine major premises of the disaster situation as shown in Table 6.2 and Table 6.7.

After the process of collaborative discussion, participants created a total of 57 disaster scenario component cards and 58 action component cards. As shown in Figure 6.3 and Table 6.5, each group of relief (Group A), response (Group B), and recovery (Group C) created, respectively, 21, 23, and 13 disaster scenario component cards, and 22, 20 and 16 action component cards in the Sandankai Chart. After presentation, participants chose the action components cards that they themselves can do for disaster reduction in the local community.

Table 6.5 Components of Disaster Scenarios and Action plans of the Samcheok High School Sandankai Workshop

	Group A: Relief Within 2 Days	Group B: Response Within 2 Weeks	Group C: Recovery Within 2 Months
Disaster Scenarios	21	23	13
Action Plan Components	22	20	16

6.3.4 Action Plans for Relief, Response and Recovery Processes

Each group discussed action plans for relief, response, and recovery processes of the local community according to the disaster scenarios of each time-phase, respectively. In the Samcheok High School Sandankai Workshop, action plans of the Sandankai Chart are summarized in Table VI. The action plan of Group A mainly deals with relief and rescue activities for survival of individuals and their families, and government support for food, water and clothing. The action plan of Group B focuses on the response of the local community and organization of volunteers who systemically carry out their support from outside the area. The action plan of Group C includes not only physical recovery activities but also psychological recovery activities to sustain local community life.

Table 6.6 Summary of Action Plans of the Sandankai Chart in the Samcheok High School Sandankai Workshop

Time-Phase	Action Plan
Group A: Action Plan within Two Days (Relief)	Items relating to survival problems in personal and family areas. Residents demand government support.
Group B: Action Plan within Two Weeks (Response)	Support from outside the area. Residents start recovery activities together with volunteers, government, and military.
Group C: Action Plan within Two Months (Recovery)	Actions include psychological care of victims, solving social problems in the local community. Recovery activities are mainly carried out by local people, not outside volunteers.

The disaster scenarios and action plan developed by Group C for the recovery process of the local community are displayed in Tables 6.7 and 6.8, respectively. Participants of Group C proposed action plan components to solve disaster scenarios. For example, they suggested “Visit the homes

of elderly men for emotional care” (item number 2 in Table 6.8) to solve “Discovery of the body of an old man who lived alone” (item number 1 in Table 6.7). The action components committed by participants for implementation by themselves are underlined in Table 6.8.

Table 6.7 Disaster Scenarios Developed by Group C for the Recovery Process of the Local Community

Disaster Scenarios	
Within 1 Month	To 2 Months
1	Discovery of the body of an old man who lived alone
2	Unknown condition of the elementary school and the students
3	Medical volunteer group needs to be dispatched
4	Individuals staying in shelters in the local community
5	Buying bottled water for drinking
6	The activities of volunteers from outside (military) end
7	Damage to the government office and the health center
8	Spread of eye disease in the local area
9	Damaged walls and wallpaper
10	Flood victims deceived by a swindler
11	Vehicular traffic blocked by a destroyed bridge
12	An old woman worried about her shelter (container) when it rains
13	A married local woman ran away with a construction laborer who was working on rebuilding the local community

Table 6.8 Components of the Action Plan Developed by Group C for the Recovery Process of the Local Community

Action Plan for the Recovery Process of the Local Community	
Within 1 Month	To 2 Months
1	Carry out the special budget of government for the stricken area
2	<u>Visit the homes of elderly men for emotional care</u>
3	School teachers call students
4	<u>Establish volunteer organizations for the local community</u>
5	<u>Get along in a friendly manner with neighbors</u>
6	<u>Local government to restore water service</u>
7	<u>Clean schools</u>
8	Clear destroyed houses
9	Rebuild destroyed houses
10	<u>Manage personal health care</u>
11	Car and electronics companies provide repair services to flood victims
12	<u>Volunteers build new houses</u>
12	<u>Arrest the swindler</u>
14	Build temporary bridges for vehicular traffic
15	Begin reconstruction of bridges
16	<u>Provide ethics education to increase inhabitants' awareness of societal moral</u>

6.4 Results and Discussion

6.4.1 Results of a questionnaire after the Sandankai workshop

A questionnaire was distributed to participants in order to survey the level of understanding and the usefulness of improving risk awareness through the Sandankai Method. 30 copies of the questionnaire were distributed and a total of 26 valid responses were received after the Workshop. The questionnaire included: 1) understanding of the Sandankai method and 2) effect of the Sandankai workshop method. In order to determine the usefulness of improving disaster risk awareness using the Sandankai Method, the facilitator did not give any information about a workshop for disaster education prior to carrying out the Sandankai Workshop. Students of the Samcheok High School did not know about the implementation of a workshop before the facilitator entered the classroom, because normally he or she who has risk awareness and an interest in disaster prevention already participates in participatory workshops about disaster.

The participants have the following characteristics:

- (1) They are male students of a senior high school in the City of Samcheok. Their ages are 16 or 17 years old. They were elementary school students in 2002.
- (2) 96% of the students experienced the natural disaster of 2002 and 30% of the students who experienced the disaster were evacuated to shelters.
- (3) Participants discussed the topic of disaster reduction for the first time since the flood disaster of 2002.



Picture 6.3 The Samcheok Sandankai workshop

The questionnaire results are summarized as follows:

- (1) I think that the Sandankai System Method is useful for disaster situation response.
- (2) I will do everything that I can do for my local community after a disaster.
- (3) I now have an interest in natural disasters and disaster reduction.
- (4) It is difficult to understand the special vocabulary of disaster prevention.
- (5) I think that the action plans that we developed is very useful for relief, response, and recovery.
- (6) The Sandankai Workshop helped me improve risk awareness.

Regarding the question “what can you do for the local community in a flood disaster”, participants provided 12 activities as shown in Table 6.9.

Table 6.9 Action Components Students determined They can do
We can do the following for our local community

Cooperate with local people	Ask for assistance, bail out waste water
Do not put trash and dirt on the streets to prevent clogging drains	Look after the needs of those who were emotionally hurt by the disaster
Be volunteers for recovery in the local community	Learn about natural disasters
Help with activities for recovery of the local community	Prepare an emergency pack
Participate in house building projects	Provide candles and flashlights for emergency
Learn correct disaster response processes	Stock bottled water

88.5% of 26 valid responses that participants returned said that the Sandankai Workshop was useful in improving their risk awareness and increasing disaster knowledge and interest in disaster reduction as shown Figure 6.4. 57.7% of the responses stated that the best process was the collaborative discussion process among members of each group. 80.8% of the responses said that they will participate in a workshop about disaster reduction like the Sandankai system again if they have an opportunity. Through the questionnaire, it is demonstrated that the students’ disaster risk awareness is improved by participating in the Sandankai System Workshop.

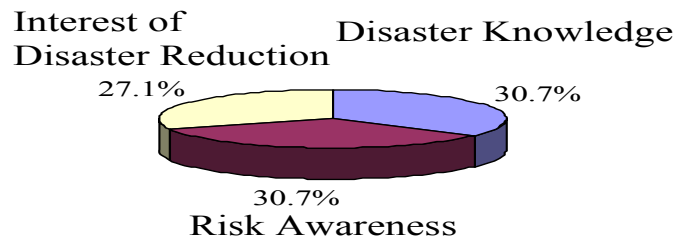


Figure 6.4 The results of the questionnaire to participants

6.4.2 Implications of recording disaster experiences by local community

With no more disasters of same level, people will forget the significant lessons about disaster reduction that were learned from low-frequency/high-impact disasters like the Super Typhoon RUSA. However, participants could remember and reproduce the experiences of that time using the Sandankai Method. The disaster experiences of the participants who were vulnerable children at the time of the disaster had not been recorded. To have the views of both the adults and the children is also useful for learning about more varied disaster situations and developing action plans for disaster management. Due to the many variables in the natural environment and in the social background in local communities, data about these experiences will provide effective material to create action plans that take the characteristics of local communities into consideration. Moreover, the participants who are current high school students recognized that they are no longer vulnerable people and can collaborate with people in the local community in disaster situations.

6.4.3 Integration of the Sandankai system and the Yonmenkaigi system for disaster risk management

The Yonmenkaigi system is a very unique participatory workshop method for collaborative action plan development for disaster reduction in local communities because the Yonmenkaigi system focuses on proactive mitigation and preparedness planning prior to a disaster not after. However, some participants of a Yonmenkaigi system workshop expressed difficulty in determining the goal/theme of issues using the SWOT analysis (Hill and Westbrook, 1997), where participants should determine their goal for disaster reduction activities in the local community.

It is possible that some participants of a workshop know the entire process of relief, response, and recovery for disaster management, but some participants do not know it because they are residents not specialists in disaster management in the local community. The image of a disaster situation is not so easy to imagine because it is dependent on the personal experience and knowledge of participants. These participants need to have an image of the disaster situation to develop an action plan in proactive disaster planning. Integration of the Sandankai system and the Yonmenkaigi system can help these participants to perform disaster planning activities and to proactively integrate disaster risk management both pre-disaster and post-disaster.

6.5 Conclusions

This chapter presented a case study in which the Sandankai Method was utilized for developing disaster scenarios and collaborative action plans for improving disaster risk communication at the local community level. Students of the Samcheok High School in the City of Samcheok, Gangwon Province, South Korea, created realistic disaster scenarios and collaborative action plans for their community recovery. They presented both the views of individuals and local community after a flood disaster through a Sandankai System Method Workshop. The Sandankai Method provides a means to go from risk awareness to collaborative action plan development for relief, response, and recovery after a disaster. Moreover, the Samcheok High School Workshop provided a starting point for participatory methods for disaster education in Korean high schools. Finally, the Sandankai Method can be utilized as a useful tool to improve risk awareness and interest in disaster reduction for enhancing the disaster coping capacity of local communities.

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Chapter 7 Conclusions

This dissertation has concentrated on implementation and analysis of the Yonmenkaigi system method to develop a collaborative action plan for disaster reduction at the local community level as participatory workshop method. The major focus is placed on studying the Yonmenkaigi system method process and the outcomes. The main contributions of this dissertation, policy implications and potential future research are summarized in the next three sections.

7.1 Summary of research outcomes

This dissertation consists of 7 chapters. Chapter 1 introduced the background of the dissertation including the research problem, objectives and the structure of the dissertation.

Chapter 2 provided the definition of participatory workshop and then reviewed the current workshop methods of Japan to improve risk awareness for disaster reduction at the local community level. It is important to point out that participatory workshop methods for collaborative action plan development are currently not available. This is a missing area in the development and implementation of participatory workshop methods for disaster reduction. Chapter 2 also includes some problems of the current workshop methods.

Chapter 3 explained the Yonmenkai system method as a participatory workshop method. It included a brief history, an overview, and the process of the Yonmenkai system method, which has been designed and used for collaborative action plan development in community-citizen vitalization initiatives called *machizukuri* in a mountainous municipality of Chizu Town, Tottori, Japan (Okada and Teratani, 2005, Tatano and Kanda, 2008). Then the chapter focused on the debating process of the Yonmenkaigi system method as a multi-level knowledge development process between participants of a Yonmenkaigi workshop.

Using the case study of Jishubosai-soshiki (Self-governed Community Association for Disaster Reduction in City of Kyoto, Japan), Chapter 4 analyzed the development of collaborative action plans through debating the process as internal knowledge development between the participants of a Yonmenkaigi workshop. The Interpretive Structural Modeling (ISM) method is used to identify the core action components of a collaborative action plan by revealing the relationships of action components.

Chapter 5 emphasized the challenge of mutual knowledge development among the Yonmenkaigi workshop participants and external stakeholders using the case study of the Kemiren Village, Merapi Volcano of Indonesia. The model of mutual knowledge development between “seed

knowledge providers” and “custom knowledge providers” are was shown. The Yonmenkaigi workshop field results from Kemiren Village were described.

Chapter 6 introduced the Sandankai system. It presented the result of a case study that was carried out in the Samcheok High School, City of Samcheok, Gangwon Province, Korea. Next, the chapter discussed the integration of the Sandankai system and the Yonmenkaigi system for intergration of disaster risk management both for pre-disaster and post-disaster.

Chapter 7 summarizes the main contributions of this study and discusses policy implications, as well as future research needs.

7.2 Policy implications

When we go into a local community with the theme of disaster prevention, we should be careful that our activities can influence the community life. It is because our research activities can have an impact on "protection of human life and property" directly. Therefore, research activities with a local community for disaster prevention should be approached with seriousness, transparency, and sincerity.

Until now, the range of disaster prevention activities together with the local community as the perspective of the researchers was recognized to support decision-making and transfer the scientific knowledge about hazards and disasters indirectly, because there was a time limit to the study period. However, in order to take responsibility for the reliability of the scientist of disaster prevention to achieve the disaster prevention activities, the researcher has to think directly as a person concerned with disaster prevention activities in a local community.

Such research activities are by no means impossible, although it is also a fact that it is quite difficult to achieve. For example, Professor Norio Okada of the Disaster Prevention Research Institute in Kyoto University is still related to the regional vitalization (“Zero-ichi” community vitalization movement in local villages and areas, international exchange, etc.) in Chizu-cho town in Tottori prefecture for 25years, since 1986.

"The Yonmenkaigi system method" which this dissertation addresses is historical proof of that long relationship. Since the original prototype was developed in 1991, the Yonmenkaigi system method has been utilized for the creation of action plan for CCPT (Chizu Creative Project Team), Zero-ichi Movement of Hayase village in 1995, Zero-ichi Movement of Yamasato area in 2008 (January), and Open ceremony of new Yamasto area including an emergency drill in 2008 (June).

To implement a Yonmenkaigi workshop in a local community, we need to start with the local diagnosis. If both local knowledge and science knowledge as meta-knowledge is not available, a Yonmenkaigi workshop cannot be used successfully as a participatory workshop.

As mentioned in Chapter 2, although participatory workshops are capturing the spotlight in Japan society as an approach for activating citizen participation in recent years in disaster prevention, it is rare to achieve results that lead to actual disaster prevention activities. Most of workshops are carried out just once, as a onetime event of a town. However, implementation of the Yonmenkaigi workshop is ongoing carried out as collaborative action plan development process. It has been continuously used in Japan's Zero-ichi Movement since 1995 and in the disaster prevention activities of the Merapi volcano area in Indonesia since 2009. It is also expected to be utilized as a development tool for collaborative action plan for resident activity at the local community level from such achievements.

In the disaster prevention section, the importance of mutual collaboration between local government, local community, and residents is emphasized greatly. That is, collaborative governance needs to be formed also for disaster risk management. Localized disaster damage, such as sudden, heavy rainfall, has increased in recent years.

Local government should assess the situation and identify measures to deal with the situation according to the local context criteria. Therefore, disaster prevention planning that considers the characteristics of the local community is needed. Since all facets of disaster management cannot be processed by a local government alone in disaster situations, opinions and participation of local residents are indispensable long before a disaster occurs. This collaborative governance needs to be formed also for disaster risk management at the local community level. And in order to achieve this goal, it is crucial to create and maintain a strong working relationship between the government and the local communities. It is the essence of citizens' participation to create a collaboration action plan with the collaboration process between the local government and the local community.

A Yonmenkaigi workshop is used to develop an action plan through decision making among participants. A Yonmenkaigi workshop can also be used as an educational tool to learn critical thinking skills.

For example, in the case of South Korea, Korean men at age 20 are required to join the army for two years. If the Yonmenkaigi system could be introduced as part of the educational activity of disaster risk management in the army, it would be helpful for their tactical thinking and would be more conscious of the need to work collaboratively. After finishing their military service, this activity would also be helpful improve disaster risk management in Korean society. The

Yonmenkaigi system could also be used in the disaster prevention curriculum of a school also as a participatory workshop method for improving disaster prevention of a local community.

In the Samcheok High School Sandankai Workshop, which was introduced in Chapter 6, about 80% of participants considered that interest in disaster and disaster prevention increased through the workshop.

Lecture-type disaster education methods are useful for teaching knowledge about hazards and disaster prevention. However, participatory workshop methods like the Yonmenkaigi system provide an opportunity for participants to constructively discuss what they should/can do in order to improve the disaster prevention activities. Moreover, participants can recognize the new value of cooperation and collaborating working. This is helpful to improve communication skills and human relations.

The Yonmenkaigi system aims at getting local government and local community to work together collaboratively. A local community discusses what we it needs to do to improve its own disaster prevention planning without depending only on the local government. Self-empowerment of the local community also leads to self-empowerment in disaster situations. This self-empowerment includes preparedness and mitigation activities before disaster, as well as relief, response and recovery activities after disaster.

In developed nations such as Japan, significant efforts have been made to protect infrastructure from major disasters. However, efforts to improve disaster education and preparedness of local community and individuals are not yet comparable. The importance of practical activities for knowledge development is increasing as a preparation for disasters

Moreover, in catastrophic natural disasters developing countries, such as the Indian Ocean Tsunami in 2004 and the Haiti earthquake in 2010, the lack of infrastructure protection measures was one of the main causes of the huge losses. However, the knowledge development side was also insufficient for disaster prevention. Since investment of the infrastructure building in a disaster prevention section is actually difficult immediately, Then, the preparations against disaster damage are also an infrastructure building in local area as well as the improvement activities of residents' knowledge development.

In the present dissertation, I have identified the patterns of the relationships of the action plan components in Yonmenkaigi workshop. In the future, I would like to more clearly identify the process of knowledge development among participants in the Yonmenkaigi workshop in order to propose a generalized model of knowledge development process.

Japan's experience and knowledge in disaster prevention could be helpful for disaster reduction in developing countries in Asia. If the improved version of the Yonmenkaigi workshop presented in this dissertation serves to improve disaster prevention at the local community level in Japan or in another Asian country, even if the contribution is small, it would be a great pleasure for me.

* The Merapi volcano erupted in Jogjakarta, Indonesia on October 26, 2010 killing about 122 people and resulting in the evacuation of about 100,000 more on November 5, 2010. The Kemiren Village, which was introduced as a case study in Chapter 5, was also evacuated. Fortunately, there were no victims in Kemiren Village. Although we do not yet know to what extent the adaption of the improved Yonmenkaigi workshop was helpful, the workshop provided the opportunity for local community to discuss their problems and develop collaborative action plans for disaster prevention activities at the local community level through citizens' participation in municipal affairs.

7.3 Future Research

The following points can be pointed out for further extension of this research.

1) Developing an evaluation method and monitoring the implementation of action plans :

As a future research theme, it would be interesting to observe the actual actions and implementation of disaster prevention activities in a community. For this purpose, research on how to systematically measure the effects of the Yonmenkaigi workshop and how to analyze the changes is required. The action plan developed through the Yonmenkaigi system is the best action plan that participants can come up with given their current skills and knowledge. It is important that they check whether components of the action plans have been carried out. However, it is more important that they continuously check and improve the original action plans following the PDCA (CAPD) management cycle.

2) Expanding the Yonmenkaigi system workshop from pre-disaster to post-disaster for involving multi-stakeholders:

This study did not consider the use of the Yonmenkaigi system for action plan development for post-disaster for recovery processes. Further research could involve the use of the Yonmenkaigi workshop for creating action plans based on post-disaster scenarios. Moreover, integration of the Sandankai system and the Yonmenkaigi system could help participants to perform disaster planning activities and to proactively integrate disaster risk management both for pre-disaster and post-disaster.

3) Providing facilitator training program for management of the Yonmenkaigi System :

Compare to other workshop methods, the participants have to determine many things for example identify the present conditions and diagnose weaknesses and strengths in a local community, imagine future situations, and create action plans. Therefore, a facilitator of a Yonmenkaigi workshop needs both an understanding about the methodology (the Yonmenkaigi system) as well as workshop management. These factors have been obstacles to the spreading of the Yonmenkaigi system. In order to solve this problem, a training program for facilitators was carried out in the example of Indonesia. However, some candidates could become facilitators who could manage the whole processes of a Yonmenkaigi workshop. A facilitator training program could lead to wider usage of the Yonmenkaigi system.

4) Development of a Web-based Yonmenkaigi system:

A Web-based Yonmenkaigi workshop would facilitate the participation of people who cannot be physically present during the workshop. A web-based Yonmenkaigi system would permit better and faster data recording to analyze the processing of the discussions among groups. Speech recognition and character recognition could also be used allowing automatic data recording and more effective dialog data analysis.

Appendix 1: Action Plan Chart in Shuhachi Yonmenkaigi workshop

Before Debating (内部審査)				
	3ヶ月以内	3ヶ月～	6ヶ月～	1年
防災会 6651	本部会議 他の地域のマップを見て参考に のせる内容？ 新マップについての支部長へアンケート 支部長への協力依頼 地図製作に反対意見について考える？	町内独自のマップが出来ないか？ 配付する範囲を決める 同時に防災組織の編成を進めたい 自治会に要請 小学校・中学校にも話する 参加会員も必要か決める	支部長以外の協力者をつくる 消火器のマップつけ 町内との会合 完成前に確認したい 配付の方法	地図の使い方を考える
交流(内・外) 6741	作成の責任団体 朱八自治連合会に提案 各種団体の交流 各団体のニーズを聞く 消防団・民生協・社協 行政との関係	他学区との意見交換 町内会地域意見調査 独居老人の調査 学校・病院 独居老人の訪問 障害者の名簿作り マップ内容	マップに乗せる内容 企業、大学連携 予算？ 広告料交渉	配布後の意見交換
支部長 8821	必要性の説明(実例) 個人情報とマップ必要性の調和 やる気を起こさせる どの程度の情報まで関係するのか 公開の範囲は？ 拒否する人への説得は？ 目的外使用を防ぐ手段は？ 情報の更新は？	町内での心配事を書き出す どういう項目を乗せてほしいか・ほしくないか アンケートに協力 知っている情報を防災会に報告 独居(老人・学生) 民生委員の仕事 家族の連絡先 持病かかかりつけ病院 火事のおきや水危険な場所調査	一緒に町内を歩いて探す 要配慮者への支援できる事は何か？	防災に興味を持って本部役員に参加
情報 (地図作成) 61531	他団体との情報交換 掲載内容のアンケート実施 参加者を住民の中からさがす 経費の有無→防災会・自治連 既存の地図発行年月日を調査 OK→掲載追加をお願い、NO→独自案作成	児童館の場所 災害用井戸水 消防車の経路 危険場所を調べる。避難経路 スローパーで食料確保 公共施設。独居老人調査 備蓄委員会の備蓄内容と場所調査 資料提供企業 公園の場所明記する(広場所) 災害用係具庫備蓄内容 避難場所と防災用品のリスト作り 町内掲示板場所・集合場所の調査 消化全の場所を調べる AED設置場所	業者選択決定 内容のリストアップ 配付基準の決定	新しいマップ防災の内容検討

After Debating (最終版)			
	3ヶ月以内	3ヶ月～	6ヶ月～
防災会 9732	地図の使い方を考える	町内独自のマップが出来ないか？	消火器のマークつけ
	本部会議	配付する範囲を決める	町内での会合
	必要性のマップ作成	同時に防災組織の編成を進めたい	支部長以外の協力者をつくる
	新マップについての支部長へアンケート	載せる内容？	町内との会合
	作成の責任団体	小学校・中学校にも話しする	
交流(内・外)61281	支部長への協力依頼	自治会に要請	
	地図製作に反対意見について考える？	参加員も必要か決める	
	防災マップの必要性事例を収集		
	他の地域のマップを見て参考にする		
	来八自治連合会に提案	参加者を住民の中からさがす	企業、大学連携
	各種団体の交流	他学区との意見交換	予算？
	各団体のニーズを聞く	町内会地域意見調査	報道関係にPRする
	消防団・民生協・社協	独居老人の調査	広報科交渉
	行政との関係	学校・病院	マップ作成コンテストの実施
	掲載内容のアンケート実施	独居老人の訪問	支部長以外の協力者をつくる
		障害者の名簿作り	町内との会合
		広報する	
		マップに乗せる内容	
		参加員も必要か決める	
		自治会に要請	
支部長 10821	必要性の説明(事例)	町内での心記事を書き出す	一緒に町内を歩いて探す
	個人情報とマップ必要性の調和	どういう項目を乗せてほしいか・ほしくないか？	要配慮者への支援できる事は何か？
	やる気を起こさせる	知っている情報を防災会に報告	
	どの程度の情報まで開示するのか	独居(老人・学生)	
	公開の範囲は？	民生委員の仕事	
	拒否する人への影響は？	家族の連絡先	
	目的外使用を防ぐ手段は？	持知かかりつけ病院	
	情報の更新は？	マップに乗せる内容	
	アンケートに協力		
	掲載内容のアンケート実施		
情報 (地図作成) 71652	既存の地図発行年月日を調査	火事のおきや水危険な場所調査	業者選択決定
	OKー掲載追加お願い、NOー独自案作成	児童館の場所	内容のリストアップ
	経費の有無ー防災会・自治連	災害用井戸水	使用ことばの統一
	他団体との情報交換	消防車の経路	配付基準の決定
	防災マップの必要性事例を収集	危険場所を調べる、避難経路	消火器のマークつけ
	掲載内容のアンケート実施	公共施設、独居老人調査	
	アンケートに協力	備蓄委員会の備蓄内容と場所調査	
		資料提供企業	
		公園の場所明記する(広場所)	
		災害用保具庫(備蓄)内容	
		避難場所と防災用品のリスト作り	
		町内掲示板場所・集合場所の調査	
		消化室の場所を調べる	
		AED設置場所	
		載せる内容？	
			新しいマップ防災の内容検討
			協力店のアンケート作成
			(できるだけ地域認定)

Appendix 2: Action Plan Chart in Kemiren Yonmenkaigi workshop

Group	Within 1 st – 4 th week of September 2009	Within 1 st – 3 rd week of October 2009	Within 4 th week of October 2009
Information	• Making invitation for implementation meeting through TPR (Sukamto) • Making invitation for committee establishment • Making permission letter for Satpol-PP (Sukamto) • Making permission letter for Regency (Wiyono) • Making permission letter for Transportation Agency (Sukamto) • Making permission letter for Polsek (Sukamto) • Making permission letter for Polres (Wiyono) • Making permission letter for District (Sukamto) • Making permission letter for Village (Tugino) • Making permission letter for Koramil (Sukamto) • Making permission letter for Mining Agency (Wiyono) • Making permission letter for depo (Sukamto) • <u>Meeting with related government agencies (M+I)</u> • <u>Letters Distribution to related government agencies (M+I)</u>	• Making coordination invitation • Making evaluation meeting invitation for Polsek (Wiyono) • Making evaluation meeting invitation for Koramil (Wiyono) • Making evaluation meeting invitation for Transportation Agency (Wiyono) • Making evaluation meeting invitation for Mining Agency (Wiyono) • Making evaluation meeting invitation for District (Tugino) • Making evaluation meeting invitation for Village (Tugino) • Making evaluation meeting invitation for Armada (Tugino) • Making evaluation meeting invitation for Satpol-PP (Sukamto) • Making evaluation meeting invitation for Polres (Sukamto) • Making survey format • Collecting survey data daily (Sukamto) • <u>Agenda Planning (M+I)</u> • Receiving data (Sukamto) • <u>Drawing conclusion of evaluation results (I+S)</u>	• <u>Making workshop invitation (I+S, Sukamto)</u> • <u>Carrying out workshop (Sukamto) (I+S)</u>

Note:

 : Arrange
 : Add

 : Delete

 : Underline sentence is a collaborative action among several groups

Group	Within 1 st – 4 th week of September 2009	Within 1 st – 3 rd week of October 2009	Within 4 th week of October 2009
Soft Logistic	• Determining survey personnel (Agung, Yusuf, Sutarno) • Permission arrangement (Nurohman, Agung) • Arrangement of surveyor (Sutarno) • Determining PIC for survey location (Yusuf) • Preparation of base camp establishment (Yusuf S, Heri) • Communication Preparation (Iswahyanto, Istiarno) • Determining PIC on report (Agung) • Publication/Permission distribution (Istiarno, Wahyu S, Wiyono) • Making survey format • Establishing committee • Field task Distribution • Schedule arrangement for the implementation • Making form (M+S)	• Data receiver (Yusuf, Nurohman, Istiarno) • Distributing logistic (Salem) • <u>Implementation of field task (M+S)</u> • <u>Collecting survey data daily (M+S)</u> • <u>Processing data per week (M+S)</u> • <u>Summarizing the data (M+S)</u> • <u>Conducting weekly evaluation (M+S)</u> • <u>Drawing conclusion of evaluation results (I+S)</u>	• Data entry (Nurohman, Heri) • Report Compilation (Agung, Yusuf, Nurohman, Heri, Sutarno) • Report Authorization (Kades) • <u>Making workshop invitation (I+S)</u> • <u>Classifying the collected data (M+S)</u> • <u>Processing the data (M+S)</u> • <u>Making budget report (M+S)</u> • <u>Making report on the whole data (M+S)</u> • <u>Carrying out workshop (I+S)</u>

Note:

 : Arrange
 : Add

 : Delete

— : Underline sentence is a collaborative action among several groups

Group	Within 1 st – 4 th week of September 2009	Within 1 st – 3 rd week of October 2009	Within 4 th week of October 2009
Hard Logistic	• Equipment Survey • Location Survey • Survey of tent price (Sugito) • Survey of food price (Giyanto) • Procurement of communication means • Tent installation (Yusuf) • Making form (Agung) • Procurement of camera (Comdev) • Procurement of uniforms • Stationary survey • Procurement of sticker for trucks that are already surveyed • Defining man/day • Survey Design • Proposed Budget Compilation • <u>Proposal Compilation (M+H)</u> • <u>Funding (M+H)</u>	• Procurement of chairs • Preparing transportation means • Procurement of genset • Procurement of flashlight • Procurement of measure equipment • Preparing food • Procurement of masks • Procurement of raincoats • Procurement of ladder • Procurement of umbrellas • Procurement of banner • Entertainment: TV/player	• Preparing stationary • Procurement of projector • Preparing place for evaluation • Documenting field activity • Printing the field activity pictures • Preparing food for the consumption

Note:

 : Arrange
 : Add

 : Delete

 : Underline sentence is a collaborative action among several groups

