



災害リスクを含む多様なリスクの下での
総合的な都市・地域マネジメントのため
の方法論の提唱

Urban Diagnosis and Integrated Disaster Risk Management

Abstract:

The need for integrated disaster risk management (IDRiM) as a novel perspective for dealing with 21st century disaster prevention in both Japan, China and the world is addressed. When cities are focused, the methodological leverage of “urban diagnosis” linked with IDRiM is very effective. A prototype scheme of risk management (RM) is explained, and an extended version of RM for disaster management proposed. This is followed by our premise that this type of risk management inevitably calls for an “integrated” approach, and its rationale is examined. A definition of urban diagnosis is provided and its prospective role in disaster management in this 21st century is discussed. In conclusion the need to examine meta-level conditions for IDRiM development such as “the culture and climate for IDRiM” and documenting the “process technology” of implementing IDRiM in real-world practice are addressed.

Keywords: disaster prevention, integrated disaster risk management, novel public management, urban diagnosis, implementation technology

1. Introduction

The 21st century is seeing a turning point in disaster prevention. There is an emerging trend in disaster management to include the perspective and methodology of risk management coupled with urban diagnosis, all driven by the novel tide of the times, and marked by what may be called “novel public management.” For instance, evidences are already available on the emerging role of NGOs in civil society, increasing significance of government-private

sector partnerships, and the extending spectrum of social services in both need and provision. Tentatively let this new trend in disaster management be referred to as a “novel public disaster management.”

In Japan as well as in North America and Western Europe this novel public disaster management is already in operation and expanding year by year. Due to the different socio-cultural contexts of countries and regions, this trend is not yet visible and clear in other Asian countries such as China but the direction of such a change and its driving force are everywhere persistent

and therefore unavoidable. This provides a sound rationale for incorporating in disaster prevention the new perspective of integrated disaster risk management (IDRiM). In addition there are many other reasons for introducing IDRiM, which are elaborated on here.

2. What is Risk Management?

(1) The prototype risk management scheme discussed by Okada (1986 and 1988) is shown in Fig. 1. The key is the clear distinction made between the ideas of “danger” and “damage.” The first trigger event in the occurrence of danger is called “peril” and surrounding factors that may either promote or inhibit subsequent events that may be triggered by the peril are referred to as “hazards.” Damage, loss or impact, if caused, is the final outcome. In the following we simply use the term “loss,” to mean damage or impact also (see Fig. 1).

(2) In the intermediate process in which a peril results in loss, “subject agents” are committed to take an action and to interact with both the peril and hazards.

“Object agents” also are there that suffer loss. The occurrence of loss therefore can be interpreted as the outcome of subject agents taking “actions” and interacting with both the peril and hazards, and eventually attacking respective object agents. Note that subject agents (SA) and object agents (OA) are clearly identifiable; SA have the capacity to act, and take responsibility for the inherent results. OA suffer loss. If OA are expected to have the capacity to accept (a part of) the loss and also responsible for action-taking (decision-making) in one way or another, OA also become SA.

(3) The conventional model for this prototype risk management scheme is the “private management” one characterized by the equivalence of both subject and object agents. This

basic model operates on the “principle of self-responsibility.” In contrast the “public management model” assumes a society, community or region consisting of multiple agents, and most commonly, a government or an entity of public interest. In this model the subject and object agents may not always be identical. Some agents are governmental (public sector), non-governmental (e.g., private sector NGOs or citizens and individuals.) Moreover SA and OA are not always a priori identifiable and therefore not so self-evident. We need to set up and determine the boundaries for those “stakeholders” belonging to their communication platforms. As explained later, this is part of the reason why a participatory approach is needed.

(4) Another key concept that intrinsically characterizes risk management is the presence of “unknowns” and “uncertainties” (non-deterministic factors) inherent in the occurrences of the peril, hazards and loss. The use of the theory of probability and a statistical approach is vital in modeling uncertain events. People, however, need to meet the challenges of “unknowns” and of “inexperienced” events which need to be figured out and anticipated with viable ideas and broad imagination, based on the available body of scientific knowledge and accumulated experience to date, with the assistance of tools and media that best support our imagination.

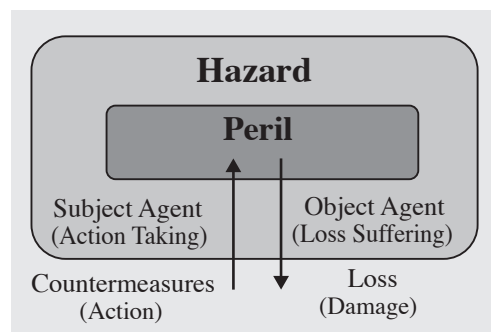


Fig. 1 Prototype for risk management

3. Introduction Of Risk Management To Disaster Management: A Variant Of The Prototype Scheme

As shown in Fig. 2, the essential difference between disaster prevention and the generic form of risk management is that the former is characterized by the concept of a region or city as a common (public) space. Moreover disaster is typified by unwelcome triggering events, and object agents (and their assets and belongings) are characterized by their distribution or concentration in space, and their vulnerabilities in responding to triggered events (Okada, 2002).

Fig. 3 shows a variant of the prototype scheme for risk management (Fig. 1), with well incorporated specifics of disaster management. Note that “peril” in Fig. 1 corresponds to “HAZARD” (with focus on its original meaning of an unavoidable natural hazardous event) in

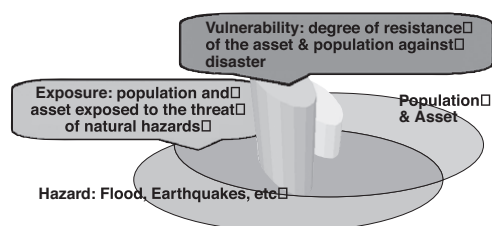


Fig. 2 City Space as Overlaps of Hazard, Exposure and Vulnerability

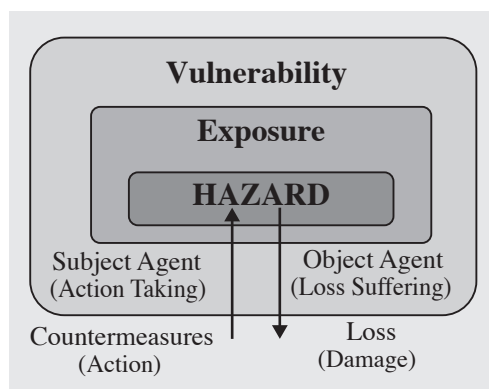


Fig. 3 Variant of prototype scheme for disaster risk management

Fig. 2. Likewise “Hazard” in Fig. 1 corresponds either to “exposure” or “vulnerability.” Here, “exposure” refers to the “spatial distribution or frequency of an involved object agent exposed to the HAZARD.” The term “vulnerability” is the extent to which the object agent (OA) is vulnerable to the forces of the

hazard and the degree of exposure.

This type scheme has the following significance:

- i) “Disaster” is differentiated from “HAZARD,” the former occurring only when a HAZARD results in the occurrence of the latter, i.e., loss (damage).
- ii) “Disaster” is an outcome of risk management in which unknowns and uncertainties are inherent.
- iii) “Disaster” is caused and promoted by the degree and pattern of vulnerability and by the exposure of the involved object agents spatially and temporally distributed over a common region, city or local community.

4. Pre-Disaster Risk Management Vs. Post-Disaster Risk Management

Consider a timeline of risk management that divides itself into pre-disaster (pre-event) and post-disaster (post-event) management. The former is proactive management in anticipation of probable disaster. The latter is retroactive management classified into phases of “immediately after,” “in the middle of,” and “soon after and in due course of time,” respectively corresponding to “emergency management,” “crisis management” and “recovery and restoration management.” Usually performance of retrospective management largely is constrained by time resources and information available real-time. Decisions therefore have to be immediate and linked directly to its actual practice,

characteristically making them “irreversible.” This “irreversibility,” as well as “limited short span of time,” together with the “scanty amount of information” constrains emergency and crisis management (Okada et al., 2001).

The interrelationship between pre- and post-disaster risk management merits attention. A community’s preparedness before disaster and people’s familiarization with emergency tools and equipment in everyday life are known to be effective in the event of the need for emergency management. People’s cohabitation patterns (a type of exposure characteristic) have been found to be closely linked to the community’s search and rescue (SAR) capability as pointed out by Kajitani et al. (2002).

5. Risk Management As A PDCA Cycle

The risk management process should be viewed as a cyclic one as in Fig. 4 showing a common scheme of risk management process as adopted by the EqTAP project (Ye et al. 2002). Alternatively Fig. 5 which shows the schematic process of PDCA (the Plan-Do-Check-Action Cycle) gives the essence of this cyclic process. Importantly, this process is not self-closed within the cycle of planning as information processing; rather this part corresponds to the stages of “identify risk” through “evaluate risk” in Fig. 4. The process is required to extend beyond “planning” to “doing,” “checking,” and “action,” eventually leading back to “establish risk” or “context building” for planning and management.

Greater stress on the proactive approach requires that adaptive management be introduced, allowing for gradual and experimental practices with hypothesized countermeasures and policies to be continually monitored and revised. It also means that the PDCA cycle

process must be made in an integrated manner, particularly highlighting to “checking” and “action.” As stated later these risk management tasks centered on these phases of PDCA cycle are called “regional diagnosis;” in particular, “urban diagnosis” with cities as the focus.

The PDCA cycle can be applied also to a chain of both proactive (pre-disaster) and retroactive (post-disaster) risk management. This means that the gap between the two modes of risk management should be filled in and that the phases “CHECK” and “ACTION” on the part of the end-users of disaster management ought to be handed with their initiatives. The idea behind this is stress on the diagnosis of the status-quo based on the practice of “CHECK” and “ACTION” before “PLAN” (Okada, 2002, 2003).

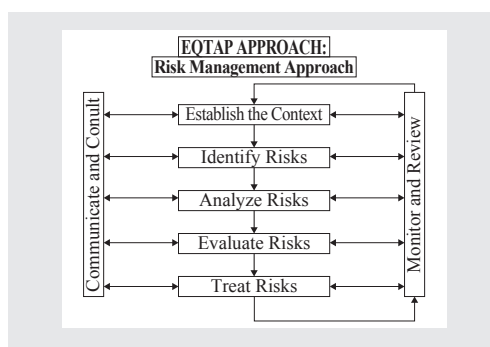


Fig. 4 EqTAP-adopted Risk Management Process

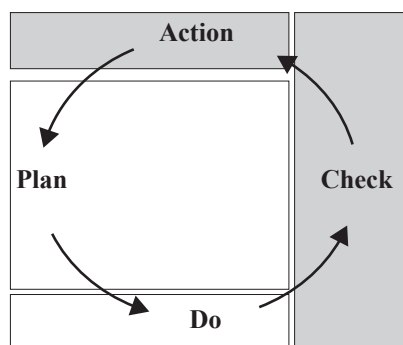


Fig. 5 PDCA Cycle Process

6. Anticipatory Approach Based On The PDCA Cycle Process

Suppose that the future outlook is highly uncertain and unknown but that our best knowledge tells us we should (and could) work out and start with a “preparatory countermeasure as a hypothesis.” Such being the case, the approach is made systematic by basing risk management on the PDCA Cycle Process. This is called the “anticipatory approach” or “precautionary approach.” If this cyclic process intends to induce the evolution of an innovative organizational or socio-cultural scheme, a systematic ecology approach called “adaptive management” may serve well for the purpose. In that case a preparatory countermeasure as a hypothesis is referred to as a “policy” to test empirically (see Fig. 6).

A typical example is the Tonankai twin earthquake disaster that is predicted scientifically to occur with a probability of ca. 0.95 in 50 years in the Pacific metropolises of the Tokai and Nankai Regions of Japan (Okada, 2003). Many governmental initiatives have now been in order to best prepare for this imminent earthquake. We need to meet the challenge of this earthquake risk by an anticipatory approach. A question here is: what policy should be set up as a hypothesis?

Ongoing research challenge focusing on

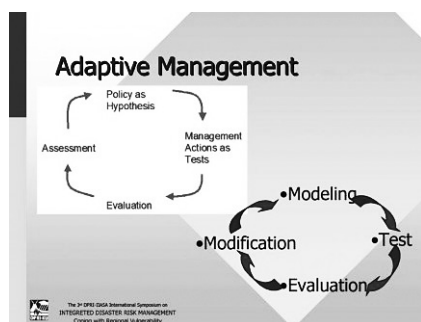


Fig. 6 Process of Adaptive Management

Nagoya City is relatively convincing. So far, the crucial themes identified are (a) how to set up a communication platform for implementation of integrated disaster risk management, (b) which level of government or which type of governance is fit for which type of platform building in terms of geo-space, jurisdiction, and expertise (combined as “decision common space” as to geography, jurisdiction, common knowledge, and technology”), and most important and most difficult, (c) who are able to grow gradually into independent and responsible stakeholders as most of those taking part initially may not necessarily be identical to stakeholders in the real sense of the English language term. This means that the adaptive process of implementing multi-participant decision-making and practices for a variety of disaster risks hypothetically is expected eventually to make participants become stakeholders. This is taken up later in terms of socio-cultural backgrounds and human climate which are considered to override, at meta-level, the communication platform and its practice and process of integrated risk management in a specific form.

7. Urban Ddiagnosis

A lesson learned from the 1995 Hanshin-Awaji Earthquake Disaster is that we need to change our thinking to manage the kind of low-frequency/ high impact disaster that may hit the heart of a densely populated metropolis. We need to be able to manage such catastrophic risks in a more integrated manner;

- i. Disaster management needs to be linked more closely and consistently to urban planning and management.
- ii. Disaster management should be extended to include the predisaster phase and the time mode of daily life.
- iii. Disaster management is required to

deal with multiple hazards as well as the combined and chained consequences triggered by the occurrence of a single hazard.

- iv. Disaster management is not the province solely of the government sector, it must be participated in by the NGOs, private companies, and citizens (particularly residents living in the neighborhood).

Fig. 7 depicts a five-storey pagoda model for viewing a city (region or community) as a vital complex system (Okada, 2002; 2003-1, 2003-2). The top tier corresponds to the “living activity” level, the fourth to the “land-use and built-environment” level, the third to “infrastructure,” the second to “social environment,” and the first (bottom) to “natural environment.” With the rise in level, the speed of change increases. Much disaster risk is commonly latent and distributed spatially/temporally across the city. Moreover social hazards may lie in ambush on niches between the different layers in this spatial/temporal system.

In the event of a catastrophic disaster, such spatial/temporal risks will be exposed and in the absence of due awareness of these risks, damage will be more severe than if disaster risks were properly managed. Analogous to the management of health risks to the human body, the methodology of comprehensive examination

of spatial/temporal risks can be interpreted as that of the diagnosis of a city as living body. Let us call this methodology “urban diagnosis.”

The four items listed above point to the need of conducting urban diagnosis for disaster risk management. Note that principally for urban diagnosis proper place is not so much in “Plan” but in “Do,” and, is more in “Check” and “Action” in the PDCA Cyclic Process. This is because we need to monitor and check up status-quo conditions before and after treatment (a countermeasure or policy) has been introduced as a hypothesis. It is important that basically the outputs of urban diagnosis should be open to the public. But this prognosis made starts another round of the PDCA Cyclic Process. A revised prescription and treatment can be developed and selected with “informed consent.” The procedure is repeated until a process-tested treatment has been identified empirically and implemented.

8. Socio-Economic Performance Criteria As Measurements In Urban Diagnosis

As stated, urban diagnosis calls for the collaborative work of participants, and thus inevitably necessitating an agreed-upon common measurement with which to make the diagnosis and to determine directives needed for improvement. Let us call such common measurements “socio-economic performance,” which implies that they should address the meaning of choices open to them as well as what differences choices would make to societal life, if selected.

The five-year EqTAP Okada section research project has shown that the practice of urban diagnosis requires a variety of socio-economic performance criteria that address the needs and values of different prospective stakeholders. This well may justify the significance of

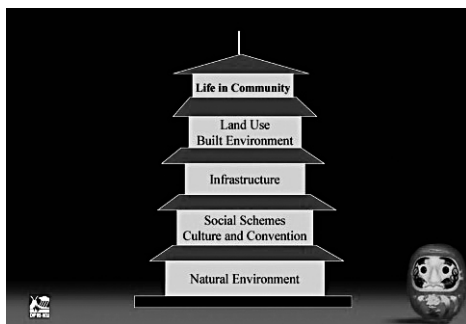


Fig. 7 City as a five-storey vital system (Pagoda Model)

the model performance criteria developed in our EqTAP research activities and which have relevance to the respective levels of the five storey pagoda model in Fig. 7. For instance the Niche Index primarily addresses the first level (top floor) of the pagoda, and the Topological Index refers to both the third echelon and second one.

9. Disaster Risk Communication As A Prerequisite Of The PDCA Cycle.

The term diagnosis has natural association with a vital system, like that of the human body. It therefore indicates a physiological approach for patients (end-users) who tend to suffer from “disaster risk syndrome.” Patients are familiar with and sensible to their problems in situ but may not be at ease with making diagnoses and prescriptions for treatment. Medical doctors (disaster practitioners and experts) tend to lack information and sensors on patient problems in situ, even though they are specialists and thus proficient in making professional diagnoses based on their experience. If they could communicate with patients appropriately and work together in making a “collaborative diagnosis,” the result would be good quality risk communication, and a good model for integrated disaster risk management would be realized. This explains why the left column in Fig. 4. is labeled “Communicate and Consult” in the risk management process. Obviously, in practice, the significance and value of introducing the participatory approach rests largely with disaster risk communication in practice. The effectiveness of “informed consent” is another aspect of disaster risk communication to be addressed if we intend to decrease risk of miscommunication and failure to reach a consensus on collaborative disaster management.

10. Novel Public Management And Novel Public Disaster Management (NPDM)

The 21st century is marked by a new trend in public management, which we call “Novel Public Management.” The term “novel” intentionally is the adjective used rather than “new” in order to distinguish our approach from what is known as “new public management” initiated by then Prime Minister Margaret Thatcher of the UK. As we posit in our conclusion, any public management, including that of disasters, must have a sound foundation based on culture and climate. Although seemingly the two forms are similar, novel public management has to develop in its own way, so as to be coordinated with culture and climate at meta-level.

So what is particularly novel about “Novel Public Management?” The following are its typical novel features:

- a. the emerging role of NGOs (NPOs)
- b. innovative schemes of public-private partnership
- c. increasing importance of citizen initiatives
- d. an institutionalized participatory process for multiple stakeholders
- e. public information as common goods and its release to society and stakeholders
- f. concerns about public risk and the increasing need for integrated risk management

These points show the need for “innovation” in public management for disaster risk; hence the need to develop the methodology for novel disaster management (NPDM), which is required to be built into the framework of, integrated disaster risk management (IDRiM). Equally important is the acquisition, accumulation, and sharing of the knowledge and arts of implementation,

in which how to implement the IDRiM per se needs to be studied and explored as a missing research area of highly practical significance. As clarified in the above discussion, the concept and methodology of urban diagnosis is considered highly consistent with the methodological challenge to accommodate the spirit and directives of NPDM.

11. CONCLUSION

In conclusion, the further research needs are

- i) Key relevant policy issues need to be identified and policy linkages developed between urban diagnosis and urban planning and management.
- ii) Further insight needs to be gained into meta-levels of integrated disaster risk management, such as the socio-cultural, historical background and processes considered to condition the actual self-revelation of integrated disaster risk management, as well as the entire scope and limits of implementation in a particular area. This overriding (meta-level) condition is termed “the culture and climate for IDRiM.”
- iii) We need to increase more case areas of implementation, in order to make comparative studies of at least two case study areas, such as the EqTAP project (Okada group) which has compared Japan and China.

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コミュニケーション・サーベイ手法による リスクコミュニケーション

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要旨

地域住民と交流を重ねつつ地域調査を実施し、その過程において信頼性を確立することを目的としたリスクコミュニケーションの新たな形態を「コミュニケーション・サーベイ手法」と提案し、避難所計画をテーマとして兵庫県神戸市長田区長田小学校区において試みた。コミュニケーション・サーベイは、①防災福祉コミュニティのニーズや関心事の抽出、②抽出された意見をもとに防災福祉コミュニティと共同してアンケート調査票を作成、③地域住民へのアンケート調査、④アンケート結果を住民と共有し、今後の取り組みについて討議を行うワークショップの実施という流れを持って行った。

キーワード：リスクコミュニケーション、コミュニケーション・サーベイ、アンケート

1 はじめに

自然災害の防止は、ハード対策とソフト対策が併用されて成り立つ。中でもソフト対策を充実させるためには、住民・地域・行政の間において、平常時に防災に関する情報の共有と理解、信頼関係の構築、さらに防災における役割分担が行われるなどのリスクマネジメントが重要である。このリスクマネジメントを支える方法の一つとして、リスクコミュニケーションの手法がある。リスクコミュニケーションは、個人・集団・組織間のリスクに関する情報と意見の相互的な交換過程であり（National Research Council, 1989）、リスクコミュニケーションの効果に影響を与える要因は、

送り手・受け手・メッセージ内容・媒体の四つに集約することができる〔吉川 1999〕。これまでに、受け手とメッセージの内容に関する要因を改善することを目的として、竹内ほか（2005）・川島ほか（2006）が、リスクコミュニケーション支援ツールの開発とその実践を試みてきた。しかし、Hovland, C. & Weiss, W. (1951) が指摘するように、リスクコミュニケーションの成否を左右する最大の要因は、送り手の信頼性である。

そこで本研究では、地域住民と交流を重ねつつ地域調査を実施し、その過程において信頼性を確立するリスクコミュニケーションの新たな形態を「コミュニケーション・サーベイ手法」と提案し、避難所計画をテーマとして兵庫県神戸市長田区長田小学校区において試みた。

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2 コミュニカティブ・サーベイ手法とは

従来のリスクコミュニケーションの形態〔吉川 1999〕を、Fig. 1 に示す。

コミュニカティブ・サーベイは、従来のリスクコミュニケーションの形態で示しているステークホルダーを、二段階に位置づけているところが大きな特徴である (Fig. 2)。研究者などのリスクの専門家は、地域の自主防災会や自治会などに対してリスクコミュニケーションを実施し、住民へは自主防災会などがリスク情報を伝達する仕組みである。この形態は、リスクコミュニケーションを通じて、地域の防災リーダーの育成をも視野に入れていることも特徴である。

また、このリスクコミュニケーションの形態は、ワークショップやアンケート調査などの従来の社会調査手法を多様に組み合わせて、長期かつ継続的に地域調査を実施する過程を通じて、ステークホルダーと専門家間の双方向のコミュニケーションを目指していることも大きな特徴として挙げられる。

今回は、コミュニカティブ・サーベイの第一段階として、リスクの専門家と自主防災会との間のリスクコミュニケーションを実施した。

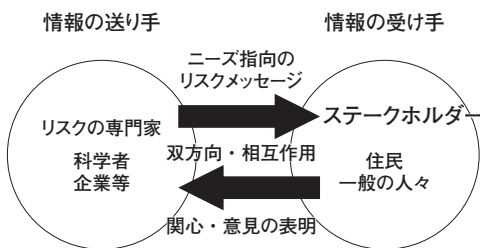


Fig. 1 Framework of Risk Communication (Kikkawa, 1999)

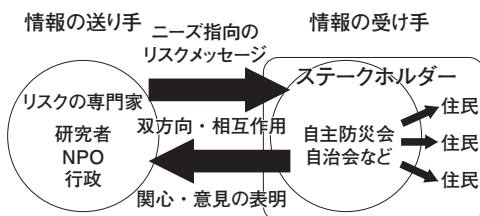


Fig. 2 Framework of Communicative Survey

3 対象地域

本研究は、兵庫県神戸市長田区長田小学校区において実施した。長田区は神戸市の中央部よりやや西に位置し、北に高取山、南に大阪湾、新湊川、苅藻川に囲まれた南北に細長い地域である。平成 7 年 1 月 17 日の阪神淡路大震災では、921 名の死者、全半焼 4,772 棟 (約 30ha)、全半壊 23,803 棟の被害が発生した。現在 103,343 人、7,100 世帯が生活する (平成 18 年 9 月 1 日現在)。震災後の平成 7 年度から、市民・事業者・市の協働により、地域の福祉活動と防災活動を融合し、地域の助け合いコミュニティの作成と地域の自主防災力を高めることを目的とした「防災福祉コミュニティ・モデル事業」がスタートした。防災福祉コミュニティは、小学校区を単位として結成されている。本研究対象地域である長田小学校区は、地震災害以外にも土砂災害と洪水災害が想定されている。この地域の防災福祉コミュニティでは、平成 12 年に「コミュニティ安全マップ」を作成・配布し、地域活動の活発な婦人会と連動して防災訓練や運動会などを開催している。

4 長田小学校区におけるコミュニカティブ・サーベイによるリスクコミュニケーションの流れ

本研究は、PDCA サイクルに則り実施している。PDCA サイクルは、W・エドワード・デミング博士によって 1950 年代に提案されたマネジメントサイクルの一つで、計画 (Plan)、実行 (Do)、評価 (Check)、改善 (Act) のプロセスを順に実施し、最後の Act を次の段階の Plan に結び付け、らせん状に継続していくマネジメント手法である (Fig. 3)。本研究ではこの PDCA サイクルを「Check (評価)」から開始し、その中においてさらに PDCA サイクルを実施した。

長田小学校区では、避難所計画を目的として、①防災福祉コミュニティのニーズや関心事の抽出、②抽出された意見をもとに防災福祉コミュニティと共同してアンケート調査票を作成、③地域住民へのアンケート調査、④アンケート結果を住

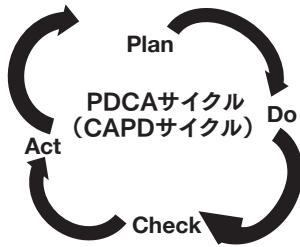


Fig. 3 PDCA Cycle

民と共有し、今後の取り組みについて討議を行うワークショップの実施という流れをもって行った。

5 アンケート調査

5.1 実施概要

調査テーマ：「避難所計画について地域の皆様と共に学ぶためのアンケート調査」

実施日時：2006年7月21日～8月4日

実施場所：神戸市長田区長田小学校区

実施者：長田小学校区防災福祉コミュニティ・婦人会・民生委員会・京都大学防災研究所

対象者：防災福祉コミュニティ・婦人会・民生委員・長田小学校区住民

配布・回収方法：訪問配布・訪問回収

配布数・回収数：50部／50部（回収率100%）

調査項目：被災経験・防災対策状況・避難所に関して・コミュニティ安全マップに関して

5.2 結果

5.2.1 災害の経験について

被災経験に関しては、平成7年の阪神淡路大震災を9割の人が経験しているという特性がみられた。洪水の経験は、最も古いもので1937年（昭和12年）6月が記載され、全部で12件であった。すべて兵庫県内での記録であった。1967年（昭和42年）7月の経験を記載した人が4人と最多であった。

阪神淡路大震災の経験者は9割であったが、避難所での生活経験は、18%であった。避難所生活

での問題点としては、「トイレ」「水」「食事」「子供」「迷惑な人」「ペット」などが挙げられた。

5.2.2 長田小学校区における自然災害発生の可能性について

地震災害は、「わからない」が最も多く、次いで「やや高い」となった。洪水災害は、「非常に低い」が最も多く、次いで「やや低い」「わからない」となった。がけ崩れに関しては、「非常に高い」が最も少なく、他の項目は似た傾向を示した。

5.2.3 地震災害に対する備え

携帯ラジオや懐中電灯を用意している人が最も多く、防災コミュニティマップを確認している人も半数を超えた。どの項目も2割程度の人は実施していた。

5.2.4 地震災害時の行動

地震災害が発生したと仮定した場合の行動は、「家族と一緒に逃げる」が最も多かった。「一人で逃げる」「隣の人と一緒に逃げる」は5～6%であった。「逃げない」と回答した人が3割いた。

「どのタイミングで逃げるか」という質問に対しては、「2回目のゆれがあったら」「家が壊れたら」「ゆれがおさまったら」「状況によって」などが挙げられた。「どのような情報をもとに逃げるか」という質問に対しては、「ラジオ」「消防などの呼びかけ」「自己判断、周りの人の呼びかけ」が挙げられた。「どこへ逃げますか」という項目に関しては、19名が回答したが、「学校・避難場所」と答えた人は12名であり、残りの7名は「長田小学校」や「西山公園」と具体的に場所を述べた。

5.2.5 避難所について

9割近くの人が、「長田小学校」を収容避難所として認識していた。避難所までの距離は「500未満」と認識している人が最も多く、その所要時間は10分以内と考えている人がやはり9割近かった。災害後の「一時避難所」には、どの災害種に関しても「収容避難場所」を考えている人が多かった。このときの理由として、「安全だから」「近いから」「他に無いから」「広いから」「阪神淡路の

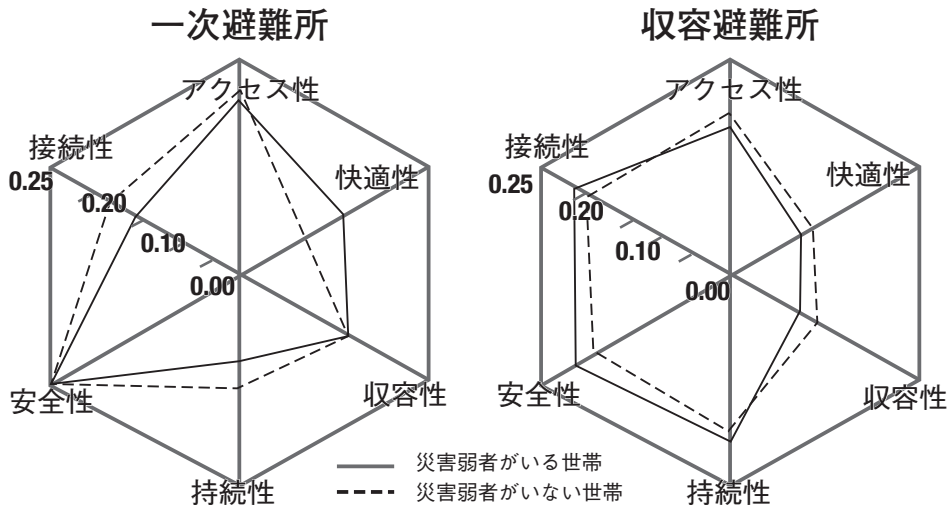


Fig. 4 Difference of a Choice Condition of Temporary Disaster Shelter and Accommodation Disaster Shelter

経験から」などが挙げた。「考えていなかった」という回答もみられた。次に問5-4で、1~5を回答した人のみに、「一時避難所」の次の避難場所を聞いたところ、「最寄りの公園」が最も多かった。

一時避難所と収容避難所それぞれの選択条件を見ると、一時避難所では、安全性や近接さ、コミュニティを重視する傾向がみられ、収容避難所では、食事や情報の提供など生活環境に関する項目を重視する傾向がみられた (Fig. 4)。

5.2.6 コミュニティ安全マップについて

平成12年に配布された防災福祉コミュニティ発行の「コミュニティ安全マップ」に関しては、7割以上がその散在を認知しており、6割が更新を希望していた。更新の際に費用負担が必要な場合は、半数の人が負担を受け入れており、その額は100円から5000円まで幅がみられた。

コミュニティ安全マップに追加して欲しい情報としては、アンケート票に示した項目以外に、「危険箇所」「公園・広場」「薬局」「車両通行止め区間」「ガソリンスタンド」「掲示板」「コンビニ」「介護支援センター」「水の供給場所」「駐車場」が挙げられた。

5.2.7 地域や社会、災害に関する意識について

「地域での避難訓練に参加する時間を作るのは困難だ」という項目以外は、「ややそう思う」がもっとも多く全体的に同様な傾向がみられた。全体的に地域活動に関しては積極的な傾向があるが、「災害に備えて地域で活動するのは大変だと思う」、「地域で防災活動に取り組むには、時間や手間がかかる」という項目においても「ややそう思う」が半数近くを占めた。

5.2.8 回答者属性

50歳以上が100%であり、女性が70%をしめた。世帯人数は2人家族が最も多く、次いで3人家族であった。56%で災害弱者はいないと回答した。家屋に関しては、74%が一戸建てであり、ほぼ同率で木造家屋である。90%が自己所有であった。居住年数は30年以上が全体の64%を占めた。防災福祉コミュニティや婦人会などの地域活動へは、9割以上が参加していた。

5.3 考察

回答者属性に年齢的偏りが発生したのは、アンケート票を配布した防災福祉コミュニティと婦人会を組織する年齢構成を反映したものと考えられる。

9割近くの人が収容避難所に長田小学校を挙げていることから、災害時に長田小学校に避難する人が集中することが予測される。長田小学校区では、他にも3箇所の指定収容避難所があることから、長田小学校以外への戦略的な配分計画を行う必要がある。また、これらの配分計画は広く長田小学校区の住民に認知される必要があると考えられる。コミュニティ安全マップに関する質問項目では、コミュニティ安全マップの更新希望が6割であることから、避難所計画に関する情報をコミュニティ安全マップに取り入れることも有用な手段であると考えられる。

5.4 報告会

アンケート調査の報告会を2006年10月22日に長田小学校にて開催した。参加者は、防災福祉コミュニティ8名と婦人会12名の計20名であった。

アンケート結果とその結果を用いた避難所シミュレーションの結果(Wei et al., 2007)を基に議論が行われ、コミュニティ安全マップの更新と活用に関して今後取り組むことが確認された。

6 おわりに

本研究では、「コミュニケーション・サーベイ手法」と題した新たなリスクコミュニケーションの新たな形態を提案し、避難所計画をテーマとして兵庫県神戸市長田区長田小学校区においてアンケート調査を実施した。このアンケート調査では、地域住民の避難所への認識に関する問題点を明らかにし、その結果を基に行った避難所設計のシミュレーション結果から、地域特有の問題点が明らかにした。今後は、これらの問題点を具体的に話し合うためのツール開発と避難シミュレーションへのコラボラティブモデリングの開発を目指して、PDCAサイクルを次のステップへと進める計画である。

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Investigating Risk Communication with “the Communicative Survey Method”

Yukiko TAKEUCHI, Wei XU, Yoshio KAJITANI and Norio OKADA

Synopsis:

In this paper, we address the need for a new type of social survey characterized by a two-way communication approach between investigators and respondents. We propose to name this approach as “Communicative Survey.” We carried out following activities: 1. to find needs and concern of community,

2. to design a questionnaire sheet with community, 3. to carry out questionnaire survey to local residents, and 4. to hold a workshop. We propose a systematic procedural of Communicative Survey based on urban diagnosis.

Keywords:

risk communication, communicative survey, questionnaire survey

[*Journal of Natural Disaster Science*, 30(2), 2009, pp. 57–69]

A Collaborative Action Development Approach to Improving Community Disaster Reduction Using the Yonmenkaigi System

Jong-il NA*/ Norio OKADA**/ Liping FANG***

Abstract:

This paper addresses the need for the use of participatory workshop methods to improve everyday disaster response capacity locally within communities. Most current workshop methods mainly address disaster risk awareness and focus on personal post-disaster actions, despite an increasing need to create an implementable action plan by moving beyond enhancing risk awareness. This type of implementable action plan is required in order to enable participants from a local community to collaborate together. A method called the Yonmenkaigi system, originally developed in a local community in Japan, is presented for this purpose. The Yonmenkaigi system is designed to consist of the following steps: carrying out a SWOT analysis, completing the Yonmenkaigi Chart, debating between groups, and presenting a group action plan. As demonstrated in a case study carried out in the City of Kyoto, this method shows its relevance and effectiveness in developing collaborative action plans for preparedness and mitigation in disaster reduction activities in a community.

Keyword: Action plan, disaster prevention, participatory workshop method, the Yonmenkaigi System

1. Introduction

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 compares the con-

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Table 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	More risk mitigation and preparedness approach
Manual-based countermeasure approach	More anticipatory/precautionary approach
Predetermined planning (no-surprise)	More comprehensive policy-bundle approach
Sectoral countermeasure approach	More adaptive management approach
Top-down approach	More bottom-up approach

*Based on Okada (2006)

ventional 20th-century approach with the new directions that the 21st-century approach is required to take. 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 (Okada, 2004). This type of disaster warns us 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, and to engage in relief and rescue activities as quickly as possible. This results in more stress and emphasis being placed on the roles of local communities, or “community self-reliance” (*kyojo* in Japanese), as well as on self-reliance, or “household/individual reliance” (*jijo*) (Government of Japan, 2008).

As a result, governments 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 develop a disaster-resilient

community as soon as possible.

The new challenge for local communities is how to increase awareness of disaster risks, 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 endeavors by academia, like the authors’ such efforts. Equally important is the scientific leverage required to support efforts to enhance a community’s self-reliance capacity. The workshop method presented here, developed for participatory 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 paper emphasizes the point that community-based action plans can only become literally actionable, and therefore executable, if action plans drafted by local residents are collaboratively developed and matched together. If an action plan is collaboratively crafted by local residents, commitment to implement the plan by local residents is significantly improved.

Most participation-oriented workshops currently target rescue and relief activities in post-disaster situations. As currently observed, the general objective of a participatory workshop for residents is to share risk awareness

and to provide a means of communication for participants. However, such workshops have the limitation that risk awareness does not lead to action plans in disaster prevention activities. Risk awareness should be changed to implementation actions to improve the capacity of a local community in disaster situations. Workshop methods 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 paper suggests that the residents' participatory workshop method be used to develop action plans for disaster prevention activities created by the participants themselves.

In the following sections, we first briefly discuss some of the commonly used workshop methods, which have been applied in community disaster reduction planning and management. It is important to point out that 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 prevention and mitigation. Then, we specifically present 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).

The paper then introduces the authors' ongoing efforts to apply this workshop method to community disaster reduction action planning (Na et al., 2008a,b). The 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 themselves. Collaborative activities between residents and their community are an important and necessary element in improving disaster prevention activities in local communities. Specifically, we focus on a particular *jishubosai-soshiki* (self-governed community association for disaster reduction) in the City of Kyoto as the target community group for the implementation of the Yonmenkaigi system.

2. OTHER WORKSHOP METHODS

A number of workshop methods mainly focusing on post-disaster activities have been proposed in Japan. Table 2 shows the main features of four workshop methods for participatory community-based disaster reduction in Japan. 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' interests in disaster reduction activities. The general characteristics of these methods are as follows:

- 1) 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.
- 2) 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 as

Table 2. Characteristics of other workshop methods*

	<i>Visioning Workshop</i>	<i>DIG</i>	<i>CROSSROAD</i>	<i>Scenario Workshop</i>
<i>Objective</i>	Collecting visions and hopes of residents	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	Residents	Specialists, Residents
<i>Facilitator</i>	Specialists	Specialists	Specialists	Specialists
<i>Typical Size</i>	One team, one group	Multiple teams, small groups (10 people)	Multiple teams, small groups (5 people)	One team, one group (10 people)
<i>Outcomes</i>	Communication about future concerns and visions	Risk communication: Raising awareness	Risk communication: Virtual experience	Risk communication among stakeholders

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

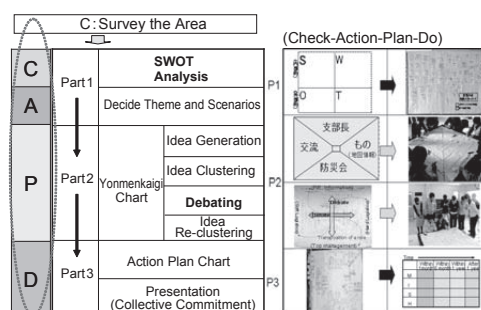
well as regarding their capacities.

- 3) Little attention is paid to the local context. Instead, often, a hypothetical situation is considered in a workshop. As a result, the workshop is unable to produce a realistic action plan based on the local context.
- 4) 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.
- 5) The 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.

3. The Yonmenkaigi System

3.1 The CAPD Cycle in The Yonmenkaigi System

The Yonmenkaigi approach is based on the check-action-plan-do (CAPD) cycle (Okada and Teratani, 2005, Matsuda and Okada, 2006). The process of a Yonmenkaigi workshop is a reflection of the CAPD management cycle. The Yonmenkaigi workshop process, which will be discussed below, includes four steps as shown in Fig. 1: carrying out a SWOT analysis, completing the Yonmenkaigi Chart, debating, and

**Fig. 1** Process of the Yonmenkaigi system

presenting an action plan chart.

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 debating and creation of an action plan chart. During this process, participants debate with each other to improve the action plan and to ensure the implementability of action plan components as well as ultimately draw up a final action plan chart for the future. These two processes correspond to the do phase of the CAPD cycle. In this way, the Yonmenkaigi system follows the process of the CAPD management cycle.

3.2 Overview of The Yonmenkaigi System

The goal of the Yonmenkaigi system is to develop an action plan for a community through a workshop, particularly in a disaster risk context. The aim is to make an action plan to reduce disaster risks. In order to make such an action plan, the method focuses on four broad aspects that are considered required issues for future actions. These four aspects (roles) are management, publication relations (PR) & information, soft logistics, and hard logistics. A group of individuals is assigned to each of the

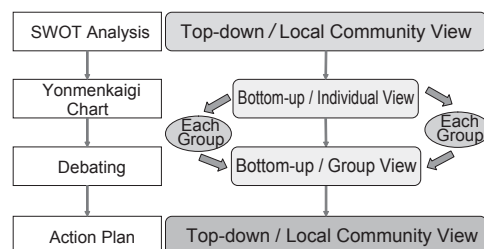


Fig. 2 Integration of individual and local community views through the Yonmenkaigi system

aspects. Each of these role-sharing elements is combined with a time dimension. Figure 2 shows the changing perspectives of the Yonmenkaigi system, which includes both individual and community views through the process of group discussion.

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/goal of the action plan. Finally, they develop an action plan to achieve their goal as well as a plan to implement the action plan.

3.3 Process of The Yonmenkaigi System

3.3.1 SWOT Analysis

A Yonmenkaigi workshop 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 reevaluate 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

internal factors	
S	W
external factors	
O	T

Fig. 3 SWOT analysis in the Yonmenkaigi system

analysis. SWOT analysis consists of four components of the community—strengths, weaknesses, opportunities, and threats—as shown in Fig. 3. S and W represent strengths and weaknesses, respectively. These are considered to be the internal factors controlled by the community residents themselves. O and T represent opportunities and threats, respectively. These are considered to be external factors including the natural environment as well as socioeconomic trends and patterns.

SWOT analysis helps participants to see the present and future risks to a community and therefore helps them 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. 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 as well as 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 Fig. 4, 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—as mentioned in Section 3.2. 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.

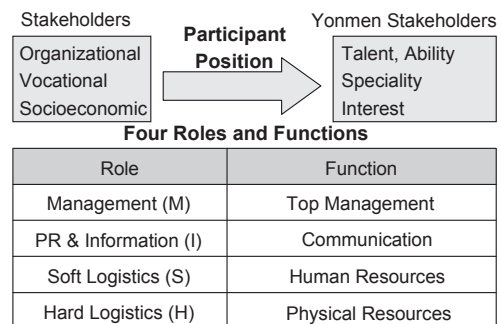


Fig. 4 Four stakeholder roles and functions in the Yonmenkaigi system

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 Fig. 5. 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.

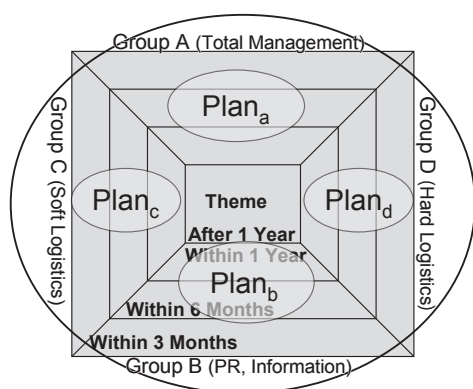


Fig. 5 Typical pattern of the Yonmenkaigi Chart

3.3.4 Debating

The next phase of the Yonmenkaigi system is debating. The Yonmenkaigi system 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

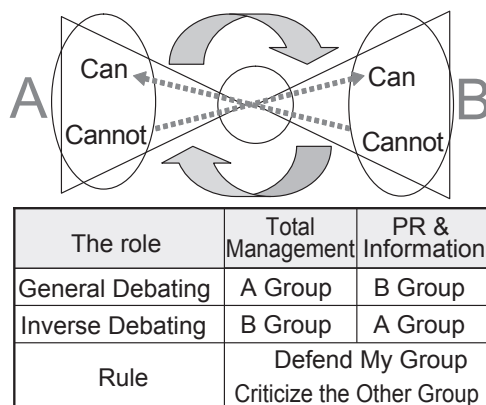


Fig. 6 Inverse debating in the Yonmenkaigi system

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 Fig. 6.

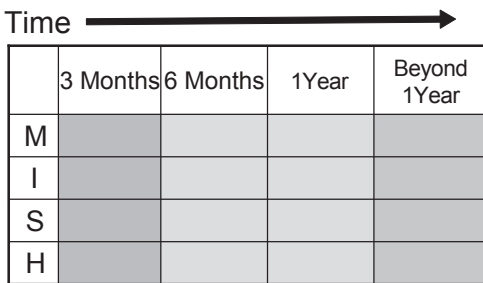
Debating provides an effective platform for combining different ideas or views and strategically processing those ideas and knowledge to create new knowledge. Debating allows each group and each individual to express and defend their views and ideas and to criticize others. Through this process, communication 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 Fig. 7. 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.



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

Fig. 7 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 Meteods

The basic characteristics of the Yonmenkaigi system are summarized in Table 3. The discussion in Sections 2, 3.1, 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:

- 1) Unlike other workshop methods, in a Yonmen kaigi 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.
- 2) 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 debating is introduced for this purpose in the Yonmenkaigi workshop method. Unlike other workshop methods, participants learn the collaborative decision-making process using debating.
- 3) 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.
- 4) 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. The Yonmenkaigi workshop method not only identifies and explores personal capaci-

Table 3. Basic characteristics of the Yonmenkaigi system

Application	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

ties and resources as well as individual ideas and views, 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.

- 5) Unlike other methods, the Yonmenkaigi system focuses more on disaster mitigation and prevention rather than on post-disaster situations.
- 6) In the Yonmenkaigi workshop method, participants take the roles of both planner and executor as the subjects of the action plans.

3.5 Collaborative Action Development During Debating

In the Yonmenkaigi workshop method, cards are an important component or tool for participants to express views 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 Fig. 8, 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

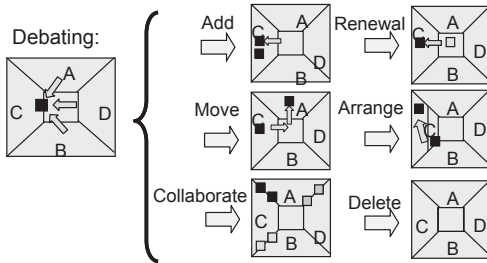


Fig. 8 Card movements during debating

plan components.

4. Shuhachi-Bosaikai: A Case Study

4.1 SHUHACHI-BOSAIKAI

The Shuhachi Elementary School area (hereafter called the Shuhachi community) is located in Nakagyo Ward in the center of Kyoto City in Japan. It is an urban residential area consisting of traditional houses, apartments for single people or families, and factories. The community has 10,939 people as of 2005 over an area of 1.055 km², divided into 52 smaller community units (*chonai* or *chonai-kai*), or neighborhood associations, which is the smallest collective self-governing unit in Japan (Nitschke, 2003).

The Shuhachi community has a *jishu-bosaisoshiki* (self-governed community association for disaster reduction) comprising a headquarters with 17 people (hereafter called the “Shuhachi-bosaikai”) and one or two representative members from every *chonai-kai* (about 80 people), as illustrated in Fig. 9. The *jishubosai-soshiki* in the Shuhachi community is a self-organized group for disaster prevention. It performs self-motivated disaster prevention activities in the Shuhachi community. Members of the *chonai-kai* are changed every one or two years according to *chonai-kai* rules. The Shuhachi-bosaikai has a partnership with



Fig. 9 The Shuhachi-bosaikai

the local fire station in the Shuhachi community. These organizations jointly conduct and manage general disaster prevention fire drills and night watch activities in the locality.

4.2 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 first 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 Shuhachibosaikai, *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 Fig. 10. From the SWOT analysis, participants learned that the Shuhachi community did not have a hazard map of their community or a local com-

S <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • The Shuhachi community plans to establish a committee to inventory warehouses for storing supplies after a disaster. • Awareness of disasters is growing among residents. 	T <ul style="list-style-type: none"> • Increase in apartment buildings • 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.

Fig. 10 Part of the SWOT analysis in the Shuhachi Yonmenkaigi workshop

Table 4. 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	15min	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)	

munity housing map.

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 Fig. 4, 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. The time frames for the

action plan considered are within 3 months, within 6 months, within 1 year, and beyond 1 year.

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:

- 1) It was first determined that there is a need to make a hazard map in the Shuhachi community.
- 2) 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*.
- 3) The Shuhachi-bosaikai recognizes that

it does not have enough resources to implement the production of a hazard map.

- 4) The Shuhachi-bosaikai should request the collaboration of other organizations in the Shuhachi community to carry out this project at the community level.
- 5) Through this scenario-making process, the Shuhachi-bosaikai recognizes the need for collaborative action in the Shuhachi community.

4.2.1 Debating

The participants created 78 action component cards in the Yonmenkaigi Chart before debating. After debating, the number of action components increased to 99 cards, as shown in Table 5. Notice that the cards for collaborative actions are counted in each of the collaborating groups. Therefore, these cards are counted more than once.

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 11.

- 1) Arrange—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.

- 2) Add—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.
- 3) Move—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.
- 4) Collaborate—The action component cards for marking fire extinguishers in the Shuhachi community and meeting with the Shuhachi schools for the hazard map as well as seven other cards were shifted to the border areas between the group playing the role of management and other groups. The participants noted that the Shuhachi-

Table 5. 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

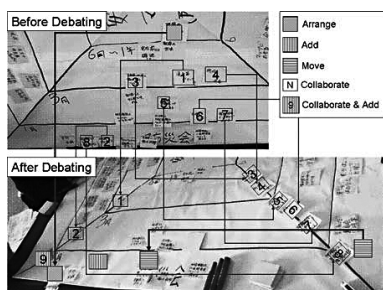


Fig. 11 Changes to action plan components after debating in the Shuhachi Yonmenkaigi workshop

bosaikai must work together with other groups to perform these action components because its own capacities are limited.

4.2.2 Action Plan Chart

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 6.

4.2.3 Analysis and Discussion

On completion of the Shuhachi Yonmenkaigi workshop, the participants were asked to fill out a questionnaire. All eight participants returned the completed questionnaire. The

questionnaire included 1) understanding of the Yonmenkaigi system and 2) impact of the participatory workshop method. The questionnaire results are summarized as follows:

- 1) I could understand the position of the other groups through the exchange of roles.
- 2) The Yonmenkaigi system helped me identify delicate matters.
- 3) I now know what we need to do and what we need to consider, because we have discussed this through oral and written communication using the Yonmenkaigi Chart.
- 4) I realize that we have to express our ideas systematically by writing rather than by oral communication only.
- 5) It is basically the same as PDCA, but it is easy to do.
- 6) I found that the different views on S (strengths) and W (weaknesses) depend on different position in the same situations.
- 7) I think that the Yonmenkaigi system provides a means to show that there are many views and many ways to achieve a project.

To support comment number 5), Fig. 12

Table 6. Partial action plan chart from 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

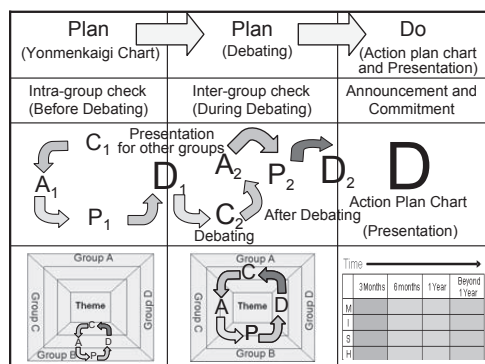


Fig. 12 The CAPD cycle of intra-group and inter-group debating

illustrates how the CAPD cycle method is incorporated into the procedures of the Yonmenkaigi system.

The Yonmenkaigi system workshop completed at the Shuhachi community demonstrates the following two main ideas:

- 1) The participants have developed a sense of joint ownership and recognized the critical value of role sharing to achieve effective collaborative actions. They learned “on the job” through the interactive communication that is systematically provided by the Yonmenkaigi system.
- 2) The participants constructed an action plan for making the hazard map suitable for the local community through the cooperation of participants, without relying on the detailed advice and knowledge of experts and government for the decision making required to carry out the goal.

As pointed out in Section 3.4, unlike other workshop methods, participants of a Yonmenkaigi workshop themselves determine the theme and scenarios of the workshop, assign roles of four aspects, and develop on their own an action plan to achieve the goal/ theme. However, we should note that much of the success (or failure) of this workshop method depends on the facili-

tation skill of the facilitator who has to clearly apply this workshop method. Participants require the guidance and advice of the facilitator, particularly when participants decide the goal and the role of the four groups through SWOT analysis. The facilitation ability of the facilitator affects the results and the processes during the phases of the Yonmenkaigi workshop method. We discovered that the participants did not have clear definitions for the scope of work of each role through the questionnaire and interviews after the Shuhachi Yonmenkaigi workshop.

After this Yonmenkaigi workshop, implementation of activities by the Shuhachi-bosaikai has changed. They planned and implemented a town-watching event for disaster prevention in the local community for Indonesian officials of disaster prevention partly at the request of Kyoto University in May 2008. The Shuhachi-bosaikai carried out the town-watching event based on the action plan chart developed in the Shuhachi Yonmenkaigi workshop, as shown in Table 6.

The Shuhachi-bosaikai opened its meetings and then asked other organizations in the Shuhachi community to collaboratively participate in the town-watching event because it recognized the need for collaborative actions through the Yonmenkaigi system. The Shuhachi-bosaikai rehearsed the town-watching event with the local fire station, Shuhachi Elementary School, and Kyoto University and recorded an English version of the presentation on education flip boards for disaster reduction for the Indonesian officials. The Shuhachi-bosaikai also contacted the mass media. As a result, the town-watching event was actually carried out through the collaboration of the Shuhachi-bosaikai, the local fire station, Shuhachi Elementary School, and the Shuhachi community. The event was reported by a newspaper, *Kyoto Shimbun*.

5. CONCLUSIONS

A participatory workshop method called the Yonmenkaigi system has been presented as a method to develop collaborative action plans at the community level. A summary of several other workshop methods is presented, and the current problem of participants not going beyond the awareness stage in disaster prevention is identified. The Yonmenkaigi system and its application to activities of self-governed community associations for disaster reduction (*jishubosai-soshiki*) are presented. Implementable action plans are developed by participants working in collaborative partnerships through the Yonmenkaigi workshop method. The Yonmenkaigi system 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. 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.

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The Yonmenkaigi System Method: An Implementation-Oriented Group Decision Support Approach

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Abstract:

The Yonmenkaigi System Method (YSM) is presented as a participatory method to support group decision making. It is composed of four main steps: conducting a SWOT analysis, completing the Yonmenkaigi chart, debating, and presenting the group's action plan. The YSM is an implementation and collaboration-oriented approach that incorporates the synergistic process of mutual learning, decision making and capacity building. It fosters small and modest breakthrough and/or innovative strategy development. The YSM addresses the issues of resource management and mobilization as well as effective involvement and commitment by participants and provides a strategic communication platform for participants. A case study for developing a disaster reduction action plan, carried out with a local community organization in the City of Kyoto, Japan, is used to demonstrate the characteristics of the YSM.

Keywords: collaborative action planning, group decision making method, participatory method, The Yonmenkaigi System Method

1 Introduction

The Yonmenkaigi System Method (YSM) is a unique and useful group decision making method. This is a participatory workshop method which was originally developed in the

mid 1980's and practiced mainly for resident-led town activation project planning and management by Teratani and his community initiative team called CCPT. At that time, Teratani, one of the authors of this paper, was the leader of CCPT, which was formed in the mountainous township of Chizu, located in Tottori Prefecture,

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Japan (Okada and Teratani 2005). The major challenges that the CCPT was facing at that time included the ability to think strategically and the need to take calculated risks to implement a series of small-scale but breakthrough-causing projects to vitalize their rural town through the initiative of residents. This type of approach was not well accepted socially and politically in Japan at that time. Given that context, once a project was planned, the CCPT motto “believe in the value and impact of resident participation but never fail in implementation” was considered a “MUST” for them.

Since that time the approach has gradually improved from the viewpoint of refinement in the concept and group decision making methodology, with assistance by Okada, Na and Fang, the other authors of this paper. The YSM has also grown in both the number of study areas and subjects of application. For example, the method has been applied to both rural and urban areas in Japan as well as in Korea, China, Indonesia, etc. The subjects and themes vary from community vitalization and student-led university projects to natural disaster reduction projects. Another challenge just presented is to include cooperatives and private sector companies in Japan to test the method’s usability in both market development and business continuity planning and management.

Through these real-life applications together with continuous monitoring, assessment and development by researchers, and without losing its original backbone character as illustrated by the motto mentioned above, the YSM has been steadily generalized; irrespective of localities and specific details of application. It is thus evolving as a unique and vital method which seems to have a great deal of application potential yet to be explored. It is noted that the most appropriate level of application is primarily at the neighborhood community level or at a workshop or small meeting within or across orga-

nizations. Na et al. (2008, 2009a,b) presented applications of the YSM for disaster reduction action planning at the community level. The major objective of this paper is to introduce the YSM by focusing mainly on its unique characteristics as an implementation-oriented group decision making method.

Currently, other workshop methods used in Japan (Komura 2004; Ichiko et al. 2005; Kikkawa and Yamori 2006; Tsubokawa et al. 2008; Yamori 2009) emphasize more on the individual decision making process and investigate personal or individual capacities and resources to develop individual action plans, rather than focusing on community-based collaborative action planning (Na et al. 2009a). Group decision making is a missing area in the development and implementation of participatory workshop methods for disaster risk management. In comparison, the YSM not only investigates and identifies personal capacities and resources as well as ideas and views of individual participants, but it also furnishes a platform for working together by focusing on other participants’ views. In addition, the YSM emphasizes more on proactive disaster mitigation

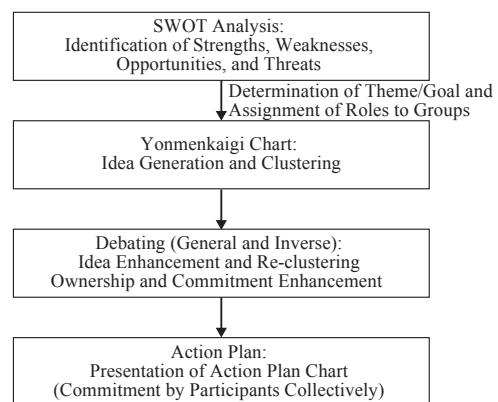


Fig. 1 Process of the Yonmenkaigi system method

and prevention planning rather than on post-disaster rescue and relief activities.

2 Procedural Outline of the Yonmenkaigi System Method

A brief outline of the YSM procedure is discussed in this section. For details, the reader is referred to Na et al. (2009a). The goal of the YSM is to develop action plans for communities and organizations through workshops or small meetings. A typical YSM workshop/meeting has 8–16 participants from a community or organization and a facilitator. As shown in Fig. 1, the process of the YSM consists of four main steps: carrying out a SWOT analysis, completing the Yonmenkaigi chart, debating, and presenting the action plan chart (Na et al. 2009a,b). Carrying out a SWOT analysis is the first step of the process. The SWOT analysis provides the participants with an opportunity to share their ideas and views about the current state of the community, which leads to a holistic and detailed view of issues faced by the community and possible future actions. In the SWOT analysis, four types of color cards, corresponding to the four SWOT categories of Strengths, Weaknesses, Opportunities, and Threats, are used to express the participants' views.

Taking into account the current conditions of the community identified during the SWOT analysis, participants then determine the theme/goal of the workshop/meeting. Afterwards, the participants are divided into four groups. Each of the four groups is assigned one of the four roles: management, public relations (PR) and information, soft logistics, and hard logistics. Actions on these four general roles are normally required to accomplish a specific theme/goal. For a particular workshop/meeting, these four roles may be redefined as groups representing different stakeholders having their own concerns and interests.

Once the group/role assignment is complete, participants start to express their views

and suggest action components in accordance with their assigned role by utilizing color cards in a specially designed chart called the Yonmenkaigi chart, as shown in Fig. 2. By constructing a Yonmenkaigi chart, participants set out the vision and actions for the four groups/roles. The action components for each of the roles are grouped according to one of the time frames, for example: within 3 months, within 6 months, within 1 year, and beyond 1 year. Participants in a group discuss among themselves and plan the actions of their assigned role. The coordinated combination of the actions developed by the four roles/groups constitutes the implementable collaborative action plan for the community/organization.

To provide an effective platform for processing, developing, and combining different ideas or views, the next phase of the YSM is debating. Notably it is a debate about what is still missing or inconsistent if each role/group wants better collaboration. In this sense it may well be called a win-win debate. There are two types of (win-win) debating within the YSM: the first one is general debating, and the second is inverse debating, in that order. General debating involves two groups engaging in interactive argument while in inverse debating, the positions and roles of two groups facing each other

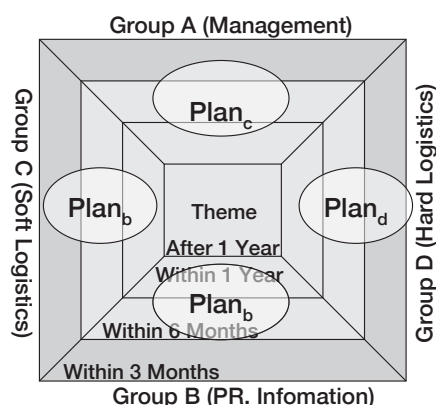


Fig. 2 Typical pattern of the Yonmenkaigi chart (Na et al. 2009a)

across the Yonmenkaigi chart are exchanged. The uniqueness and significance of the inverse debate is that it naturally motivates each group/role to become as imaginative as possible so as to challenge their own original action plan. This process effectively promotes the mutual ownership and commitment by all of the groups.

As mentioned earlier, action components reflecting ideas and views of participants are expressed by cards on the Yonmenkaigi chart. Na et al. (2009a) presented basic rules for the movement of cards: adding a new card, moving a card, deleting a card, renewal of a card, arrangement of cards, and collaboration of cards. For example, if an action component is no longer needed or desirable, the card representing this component is deleted from a Yonmenkaigi chart. Movements of cards are utilized by participants to express ideas and to exchange views, particularly during the debating process. If a component of an action plan is deemed to be obviously inferior by participants, the corresponding card is deleted.

After general and inverse debating, an implementable collaborative action plan is thus determined and well committed to by the participants using the Yonmenkaigi chart. The components of an action plan are classified by the time frame and the four roles. Finally, the participants make a presentation of the action plan using the specific roles and timelines of their plan.

3 Characterization of the Yonmenkaigi System Method as a Group Decision Support Approach

The procedure of the YSM is briefly summarized in Sect. 2. The basic characteristics of the YSM are presented in this section. The YSM:

1. is an implementation-oriented approach,

2. is a collaboration-oriented approach,
3. strategically incorporates the synergistic process of collaborative development characterized by mutual learning, decision making and capacity building,
4. is a method of small and modest breakthrough creation and/or innovative strategy development,
5. coherently addresses two fundamental themes, regardless of the specifics of the subject of application: (i) communicative and creative resource management and mobilization, and (ii) participants' effective involvement and commitment, and
6. serves as a strategic media to set up and formulate a communication platform for collaborative action development, primarily in both physical (hands-on) and epistemological forms among participants.

The aforementioned characteristics are elaborated in sequence below. Then, explanations are given to point out some unique characteristics of the YSM in comparison with other participatory methods, particularly as oriented to disaster risk management.

3.1 Implementation-Oriented Approach

The YSM is intended to find its application in the real-world and to select the issue from the actual field in order to defy over-simplification of the issue for the sake of modeling. On the other hand, it assumes that both the issue and the cause of the workshop demand concentrated discussions, debates and deliberations as well as a relevant conclusion (a workable or viable solution) within a limited period of time. Very commonly, the problem to be addressed tends to be ill-formulated rather than well-formulated. The workshop has to start with a relatively

vague (abstract) vision coupled with a loosely shared diagnosis of the current state since participants at this stage lack common knowledge and information let alone the technology and competence that may be possessed by other participating members. As a result it is not wise for the entire group of participants to proceed straight to promoting effective courses of collaborative actions since initially they lack a significant part of their central vision and directives as well as essential knowledge, technology and competence for effecting selected actions. All of this naturally leads to substantiating the remaining points.

The YSM has a special procedure for debate among participants to address implementation-crucial deficits in thinking and action initially proposed by other groups from the entire team of participants. After each round of general debate for each possible combination of groups, inverse debate is similarly conducted. The purpose is to more objectively imagine and critically review primarily one's own thinking and action. That is, each round of debate is conducted by inverting groups across a square table covered with the Yonmenkaigi chart, as shown in Fig. 2. In this way, all participants are strongly stimulated to find missing links and fallacies, particularly due to a lack of objectivity. This is critical to implementation.

3.2 Collaboration-Oriented Approach

In contrast to cases of conflict and confrontation, there are many occasions where people can see the value of sharing the same communication platform and working out some collaborative courses of action together. This is precisely the basic condition that the YSM assumes. A typical case is a natural or man-made disaster or any other contingency situation where the first priority must be given to survivability or sustaining one's own life and then the lives of

one's community instead of confronting each other. With enough imagination, individuals can reasonably get together, work out "win-win collaborative actions" and put them into practice well in advance of the actual occurrence of such a contingency. Another example occurs when any community or organization is faced with an extremely difficult situation and people are concerned about taking on the challenge to break a stalemate. They may well agree to pull themselves up and work together in order to use creative thinking to come up with an innovative solution. It is quite natural that as stated in Sect. 1, the prototype of the YSM was first developed and used by a community of people in project planning and management for community vitalization where the challenge was to break a societal stalemate and to survive a rural decline.

3.3 Strategically Incorporating the Synergistic Process of Collaborative Development

The YSM can apply effectively to the kind of ill-formulated problems that are characterized by a very loose consent to collaborate but a lack of central vision and directives as well as essential knowledge, technology and competence for effecting selected actions. Characteristically this method incorporates the synergistic process of collaborative development for mutual learning, decision making and capacity building. It is noted that this type of complete process includes not only the decision component but also components of learning and capacity building (competence development). Learning and capacity building have not been well addressed in most existing group decision making methods, to the best of the authors' knowledge.

3.4 A Method of Small and Modest Breakthrough Creation and/or Innovative Strategy Development

The YSM is a special type of group decision making method which can apply well to collaborative action development for a small and modest breakthrough and/or to innovative strategy development in a community or organization. The key to this type of creative collaboration is to discover and actually implement needed linkages to synergistically bond respective participants and sub-groups. The process is assumed to evolve phase to phase from short and mid-term to long-term as is explicitly provided for in the Yonmenkaigi chart.

3.5 Coherently Addressing Two Fundamental Themes

Regardless of the specifics of the subject of application, the YSM coherently addresses the two fundamental themes of (i) communicative and creative resource management and mobilization, and (ii) participants' effective involvement and commitment. Here "resource" has a broad sense of the term, including "information, knowledge and technology," "human resources," "goods and commodities," and "money and other financial equivalents." Though resources may have limits and constraints in terms of quantity, what matters most is not the kind of limit or constraint but rather a mindset to creatively overcome and surmount "commonly taken-for-granted barriers or boundaries" such as jurisdictional divisions, specializations, etc. This method provides a set of special devices to activate communicative and creative management and mobilization. In parallel to this organization and mobilization of resources, the YSM strategically brings forth synergistic consolidation and empowerment of all participants, thus making them tightly united and committed to

what each considers one's own duty and to what requires collaborative action.

3.6 Serving as a Strategic Media to Set Up and Formulate a Communication Platform

Last but not least, the YSM has a vital function to serve as a strategic media to set up and formulate a communication platform among participants, particularly for collaborative action development. For example, the Yonmenkaigi chart effectively provides a common paper-form media as a physical element shared by participants. They scribble their thoughts and proposed actions on small cards, paste them on the square-shaped paper, change or exchange their positions, and add, delete or combine them. Moreover they tend to use "different human senses" such as "seeing," "listening" and "touching," and thus eventually own the entire process and the output/outcome of their conclusions. The chart also serves to formulate a common epistemological setting for participants. This epistemological work also largely depends on the scoping of the problem at stake. This has to be managed by both the participants and other support staff such as the facilitator, who is instrumental and by observers and advisers who may also take part in the meeting as complementary agents.

3.7 Uniqueness of the Yonmenkaigi System Method as Compared with Other Participatory Methods

Many participatory workshop methods (Komura 2004; Ichiko et al. 2005; Kikkawa and Yamori 2006; Tsubokawa et al. 2008; Yamori 2009) have already been developed and used. However the YSM is considered unique and distinct from most of other methods for the following reasons.

- (1) None of the other methods have systematically incorporated all of the six characteristics of the YSM, as mentioned above. Only the YSM incorporates all of them.
- (2) Most methods are developed mainly for characteristic 2, i.e., a collaboration-oriented approach. Some are developed for characteristic 6, i.e., a strategic media to set up and formulate a communication platform; but are not as explicitly oriented towards the purpose of collaborative action development.
- (3) If limited only to commonly used participatory methods for disaster risk management, the method of Disaster Imagination Game (DIG) by Komura (2004) is used primarily for post-disaster emergency drill methods, using a geographical base map and collaboratively identifying participants' roles and positioning their essential operational activities in the base map. It assumes a top-down command control structure to be workable for unknown parties who are invited to join in the drill as participants. Another commonly used method is "CROSSROAD Game" developed by Kikkawa and Yamori (2006) and Yamori (2009). This is intended to be used for unknown parties or individuals who will be challenged by a series of severe "dichotomous choice-making practices" in the event of a disaster. Both of the two methods are characterized by virtual image-training purposes; DIG is a more top-down and fixed scenario-based approach, and CROSSROAD Game is a more bottom-up and open-ended scenario approach. In addition to these methods there are some other methods (for example, Ichiko et al. 2005;

Tsubokawa et al. 2008) which may be considered somewhat in-between the above two methods. In any event these methods do not explicitly address how to strategically consider the above mentioned six YSM characteristics in an integral manner. Therefore they are very different from the YSM.

4 Demonstration of the Yonmenkaigi System Method as a Group Decision Support Approach

Since the 1995 Great Hanshin (Kobe) Earthquake, the disaster planning and management paradigm in Japan has shifted. For emergency and crisis management, the roles of local communities, or "community self-reliance" (*kyojo* in Japanese), and house-holds/individuals, or "self-reliance" (*jijo*), are emphasized (Government of Japan 2008). Many local communities have established self-governed community associations for disaster reduction (*jishubosai-soshiki*). A *jishubosai-soshiki* is a volunteer group organized by residents in a local community for the purpose of organizing and implementing self-motivated disaster prevention activities in the community. In this section, a Yonmenkaigi system workshop held by a local *jishubosai-soshiki* in the City of Kyoto, Japan, is presented as a case study to demonstrate the characteristics of the YSM. The details about this Yonmenkaigi system workshop are reported by Na et al. (2009a) while this section uses the workshop to illustrate the YSM as a group decision support approach.

4.1 The Shuhachi Yonmenkaigi Workshop for Group Discussion

The Shuhachi community is an urban residential area near the Shuhachi elementary

school located in the center of the City of Kyoto. The Shuhachi community occupies an area of 1.055 square kilometers and, as of 2005, had a population of 10,939 residents. The community is composed of 52 smaller community units (chonai/chonai-kai), which are neighborhood associations. A chonai-kai constitutes the smallest collective self-governing unit in Japan (Nitschke 2003). A jishubosai-soshiki has been established in the Shuhachi community, consisting of a headquarters (Shuhachi-bosaikai) and one or two representative members from each chonai-kai. Based on chonai-kai rules, representatives from each chonai-kai are changed every year or two. The Shuhachi-bosaikai has established a partnership with the local fire station for organizing disaster reduction activities in the Shuhachi community (Na et al. 2009a).

The Shuhachi-bosaikai organized a Yonmenkaigi system workshop on January 26, 2008, to develop an action plan for the safety and security mapping of the Shuhachi community. Prior to the workshop, a questionnaire was designed and distributed to survey residents' understanding and awareness of the present situation in the local community. A total of 65 residents, including members of the Shuhachi-bosaikai and local fire station, completed the questionnaire during the period of December 22, 2007, to January 8, 2008. Eight members of the Shuhachi-bosaikai took part in the workshop on January 26, 2008, which lasted for three and a half hours. Na, the second author of this paper, served as the facilitator for the workshop. First, he discussed the rules and method of the workshop.

The results of the questionnaire were used to support the participants in carrying out the SWOT analysis of the Shuhachi community. Through the SWOT analysis, the participants discovered that the Shuhachi community did not have a hazard map or a local community housing map. Therefore, the participants deter-

mined that the theme/goal of the workshop was to produce security and safety maps of the Shuhachi community and selected a 1-year period as the available time frame for achieving the goal. From the eight participants, four groups of two each were formed to play the roles of management, PR&information, soft logistics, and hard logistics. The corresponding responsibilities of the four groups were management, communication, human resources, and physical resources; in order to achieve the overall workshop theme/goal of making security and safety maps of the community. The time scales of the action components considered by the Shuhachi Yonmenkaigi workshop are shown in Fig. 2 as: within 3 months, within 6 months, within 1 year, and beyond 1 year.

4.2 Collaborative Action Development during Win-Win Debating

During the Shuhachi Yonmenkaigi workshop, the four groups of management, PR & information, soft logistics, and hard logistics generated 18, 18, 18, and 24 action component cards, respectively, as shown in Table 1, 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 1, the cards of collaboration are included in each of the collaborating groups. During the win-win debating stage, the multi-level knowledge development process of the debating practice is reflected through card movements. As shown in Table 1, a total of 21 action components were generated for the management group during the workshop. These 21 action components are detailed in Table 2.

Table 1 Action plan components before and after debate (Na et al. 2009a)

	Management (M)	PR & information (I)	Soft logistics (S)	Hard logistics (H)
Before debate	18	18	18	24
Changes to action plan components after win-win debate				
Arrange	1	0	1	4
Add	2	3	0	3
Move	1	1	0	0
Collaborate	9	8	4	5
No change	8	15	16	18
Total	21	27	21	30

4.3 Characterization of the Yonmenkaigi System Method in the Shuhachi Workshop

The characterization of the YSM in the Shuhachi workshop is discussed here.

- (1) Implementation-oriented approach: After the SWOT analysis by participants, in the action plan period of within 1 year, three time frames were determined for carrying out the plan: within 3 months, within 6 months, and within 1 year. But while completing the Yonmenkaigi chart, participants changed the time frames to four by adding “after 1 year” as shown in Fig. 3. Participants recognized the need for changing the number of time frames in order to actually implement the plan.

- (2) Collaboration-oriented approach: According to the procedure of win-win debating as shown in Fig. 4, participants discussed the current situation and how to solve their problems. Through this process, participants were able to share information and knowledge and made an action plan to achieve the goal.

In the YSM, cards are used by participants to express and exchange action components of a plan. After completing all the debating processes, the groups

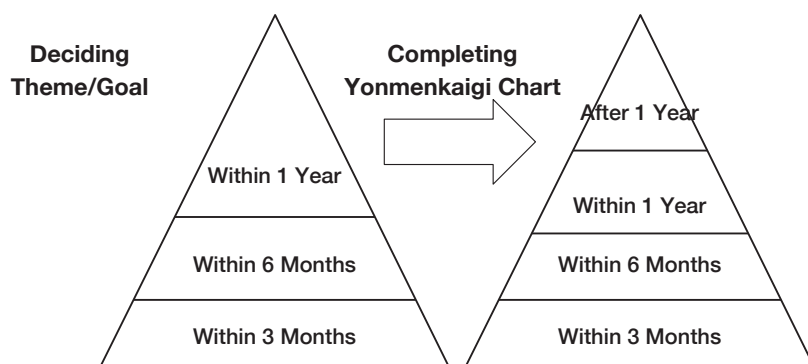
divide and share action plan components, as required. Participants work together and own the entire action plan in order to achieve their theme/goal together as showed in Fig. 4.

Action component numbers 4, 9, 10, and 14–19 in Table 2 are categorized as using a collaboration-oriented approach. These nine action components of the management group revealed during win-win debating required cooperative partnership between groups. Participants of the management group understood that current capacity and resources are not adequate to perform these action components by themselves only.

During the Shuhachi Yonmenkaigi workshop, the action component cards of “considering the contents of the proposed hazard map,” “marking available fire extinguishers in the Shuhachi community,” and “determining whether fund-raising campaigns are necessary” as well as six other cards were moved to the boundary areas between the management group and the other groups. It was noted by participants that the Shuhachi-bosaikai needs to work together with other groups to implement these action components because its own capacities are limited.

Table 2 The action components of the management group (Shuhachi-bosaikai)

	No Action components	Partnership between groups
1	Thinking about the usefulness of a hazard map	M (Arranged from beyond 1 year)
2	Collecting cases showing importance of a hazard map	M (Added)
3	Opening the Shuhachi-bosaikai meetings	M
4	Creating education flip boards describing the need for a hazard map	M+I (Added)
5	Surveying members of chonai-kai about the new hazard map using a questionnaire	M
6	Deciding who will be the main organization to create the hazard map	M (Moved from I)
7	Asking representatives from chonai-kai for help	M
8	Considering dissenting opinions of creating a hazard map in the Shuhachi community	M
9	Reviewing hazard maps of other local communities	M+I
10	Considering the contents of the proposed hazardmap	M+I+S+H
11	Discussing the feasibility of making a hazard map of every chonai-kai	M
12	Determining the distribution area of the hazard map in the Shuhachi community	M
13	Recruiting new members for the Shuhachi-bosaikai	M
14	Meeting with Shuhachi schools about the hazard map	M+I
15	Requesting cooperation from the Shuhachi community	M+I
16	Determining whether fund-raising campaigns are necessary	M+I
17	Marking available fire extinguishers in the Shuhachi community	M+H
18	Recruiting volunteers for creating the hazard map in the Shuhachi community	M+I
19	Opening the Shuhachi-bosaikai and chonai-kai meetings	M+I
20	Checking the contents of the hazard map before finalizing	M
21	Distributing the hazard map in the Shuhachi community	M

**Fig. 3** Change to time frames during completion of the Yonmenkaigi chart

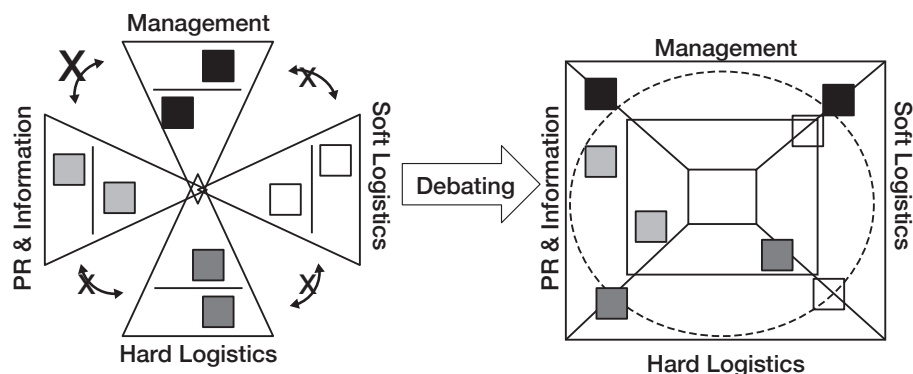


Fig. 4 Win-win debating for developing the collaborative action plan

- (3) Strategically incorporating synergistic processes of collaborative development: Through the process of win-win debating to develop a collaborative action plan, some examples of the synergistic process of collaborative development for mutual learning, decision making and capacity building (Na et al. 2009a) are:

- It was first collaboratively decided that a hazard map of the Shuhachi community is needed.
- The importance of producing a hazard map should be explained to the community and the assistance by representatives from the chonai-kai in making the hazard map should be sought.
- The Shuhachi-bosaikai is conscious that it does not have sufficient resources to create a hazard map by itself.
- Collaborative actions by the Shuhachi-bosaikai and other community organizations are required to carry out this project of making a hazard map together at the community level.

Through this process, the Shuhachi-bosaikai learned the need for collabora-

tive action for developing and implementing community-based disaster reduction activities.

- (4) A method of small and modest breakthrough creation and/or innovative strategy development: Participants discussed the priority order of the action components to improve a strategic action plan from short and mid-term to long term as shown in Figs. 4 and 5. The total number of action components in the management group increased from 18 to 21 after the debating processes to synergistically bond participants and groups.
- (5) Coherently addressing two fundamental themes: Participants can share and use their resources to perform tasks in order to achieve the goal in the Shuhachi community through management and mobilization of their action components. For example, to carry out the action components of “surveying members of chonai-kai about the new hazard map using a questionnaire” and “marking available fire extinguishers in the Shuhachi community,” the human resources required are moved to the Shuhachi-bosaikai as the management group, through group discus-

sions during debating. During the Shuhachi Yonmenkaigi workshop, the group playing the role of management added a new action component card of “collecting cases showing importance of a hazard map.” It was noted that other members requested that the Shuhachi-bosaikai should be the managing group to collect cases so that other members can share their resources. A card of “deciding who will be the main organization to create the hazard map” was moved to the group playing the role of management from the group of PR & information. The Shuhachi-bosaikai accepted a request from other groups that it should be the main organization to carry out the task of “creating the hazard map in the Shuhachi community.”

- (6) Serving as a strategic media to set up and formulate a communication platform for collaborative action development: A simple questionnaire survey of the participants after the workshop has revealed the following:
- (i) Participants can discover the possibility of creative activity for disaster reduction by experiencing new points of view through the win-win debating

processes in the Yonmenkaigi system, and can experience the group decision making processes by using “different senses” such as seeing, listening and touching, and eventually owning the entire process to realize action plans; (ii) Participants of a Yonmenkaigi system workshop in a local community effectively understand and practice collaborative activity which is properly tailored to social and cultural specifics of the local community; and (iii). They also understand the extension and realization of the adaptation of knowledge on an individual level, and then recognize the necessity of co-operation for social action by their organization using the Yonmenkaigi system.

Members of the Self-governed Community Association for Disaster Reduction (Jishubosai-soshiki) in the Shuhachi community developed an implementable collaborative action plan for their community through the collaborative-debating process of the YSM. Collaborative activities involving residents and their community are an important and necessary element to improving disaster prevention activities in a local community. Moreover, the YSM furnishes a useful tool for enhancing local communities’

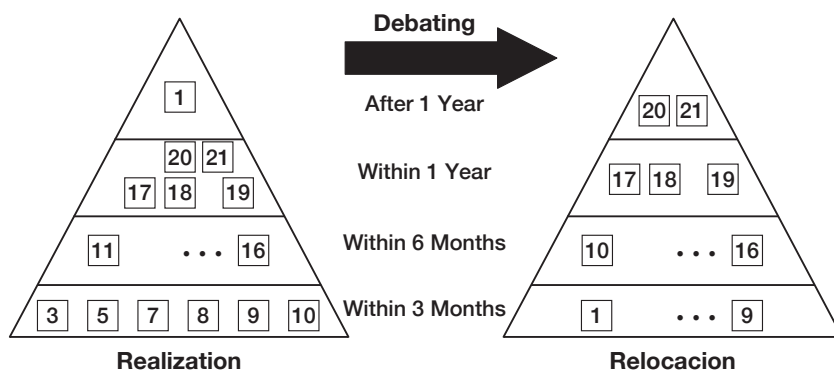


Fig. 5 Innovative strategy development in the management group after debating

disaster coping capacity and preparedness.

After the Shuhachi Yonmenkaigi workshop, social action of the Shuhachi-bosaikai has changed. They were contacted to conduct a town-watching event for disaster mitigation and prevention in the local community for Indonesian officials of disaster prevention in May 2008. The Shuhachi-bosaikai opened its meetings and requested other organizations in the community to collaboratively carry out the town-watching event based on the action plan chart developed in the Shuhachi Yonmenkaigi workshop. Through the Yonmenkaigi system, the Shuhachi-bosaikai recognized the need for collaborative actions. As a result, the town-watching event was implemented by the collaborative activities of the Shuhachi-bosaikai, the local fire station, Shuhachi Elementary School, and the Shuhachi community.

5 Conclusion

The YSM has been presented as a unique and vital method to support a very practical type of group decision making. The method has been characterized as implementation and collaboration-oriented. It has also been shown that the method effectively incorporates the synergistic process of collaborative development for mutual learning and capacity building in addition to decision making.

The YSM has been found to serve as a method of small and modest breakthrough creation and/or innovative strategy development. It also coherently addresses two fundamental themes regardless of the specifics of the subject of application: (i) communicative and creative resource management and mobilization, and (ii) participants' effective involvement and commitment. It has been shown to serve as a strategic media to set up and formulate a communication platform in both physical and epistemological

forms among participants. Illustrations have been made to demonstrate how the YSM operates in actual case study contexts.

One important note to add is that, as is common with any other participatory workshop method, this kind of method needs to be consolidated by using the accumulated knowledge of how to facilitate the procedures and actual operation. Therefore, a facilitator's role and ability is significant in successfully implementing a YSM workshop. Facilitation also requires special expertise and knowledge. How to formulate and transfer this expertise and knowledge is important research to be undertaken in the near future. Moreover, it is worth mentioning that initiative needs to be taken by some participants or sub-groups to provide a driving force for operating the YSM. Otherwise due to the participatory nature a horizontal structure tends to miss a driving force that needs to be generated from within. This is another type of dynamic characteristic which may require a different research focus.

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Community-based Decision Making in Japan

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Abstract:

An overview of participatory community-based decision systems in Japan is presented. In this disaster-prone country, effective community coping capacity has developed, largely to fill community-level needs for disaster preparation, mitigation, and response. Experience with three concepts of disaster planning and management, namely “Kyojo” (Neighborhood or Community Self-Reliance), “Jijo” (Individual or Household Self-Reliance), and “Kojo” (Government Assistance), is recounted and assessed. Then three structures for disaster management, Jishu-bosai-soshiki (Self-support Disaster Reduction Association), “Machizukuri” (citizen-led town-creation), and “Toshikeikaku” (urban or city planning), are discussed. Finally, the contributions of the three papers in this special issue are related to Japanese community practices and to the broader perspective of group decision and negotiation.

Keywords: community-based decision making, disaster culture, disaster management, group decision support systems, Japan, participatory decision making

1 Introduction

As a field of study, Group Decision and Negotiation has maintained a focus on the creation of structures within which negotiation is feasible, rather than on the negotiated decisions themselves. For example, many computer-based systems have been designed to encourage com-

munication with in a group and to facilitate group decision processes. For a discussion of the role of group decision support systems, see the articles by Ackermann and Eden (2010), Vogel and Coombes (2010), and others in the *Handbook of Group Decision and Negotiation* [Kilgour and Eden 2010].

Carefully designed group support systems, sometimes with human facilitators and some-

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times without, can enable individuals with diverse viewpoints and roles to reach agreements on difficult issues, and—when the highest level of success is achieved—to develop a shared understanding of an organization’s mission. For some groups, it is a great achievement to develop understanding of how members can contribute to a solution, and to establish a language that enables them to communicate effectively as they implement the solution. These systems are designed to be applied within an existing organization, or within a few existing organizations that find themselves compelled to cooperate.

The subject of this special issue is the development, within a natural context, of systems that achieve many of these same objectives. Japan is a country with a high frequency of natural disasters (see, for instance, CRED 2012), and a substantial rural population that is often isolated and threatened by challenges such as the Great East Japan Earthquake (Higashinippon Dai-Shinsai) of March 11 2011. In response to these grave risks, many community-based systems have been developed to regulate, coordinate, and improve responses to threats at the community level.

Within this special issue, we will describe the organization of some of these systems, and ways that have been suggested to improve them further. We believe that community-based decision making in Japan is an important model for decision processes everywhere, and that researchers and others will be well-served by understanding and emulating that model.

2 Japan’s “Disaster Culture:” A Cooperation/ Collaboration Society

At the end of every year, a Japanese non-profit organization, whose main role is to certify literacy levels in Chinese characters, conducts a survey to identify the Chinese character that

is most appropriate to represent the events of the previous year and their implications. In 2011, the year of the Great East Japan Earthquake Disaster, approximately 500,000 votes were cast; the Chinese character 絆, “KIZUNA,” meaning “bonds” or “ties among individuals,” was the winner (Japan Society for the Examination of Chinese Literacy Levels 2011).

In fact, the focus on cooperation is not surprising. There is convincing evidence (Dentsu Inc. 2011; JTB Comprehensive Research Institute 2012) that after large-scale disasters many Japanese, especially younger people, place higher values on family bonds, cooperation and collaboration at the family and community levels, and provision of help to disaster-ravaged communities. In contrast, prior to the disaster attitudes later described as “excessive competition,” engagement in a “win or lose game,” and immersion in “nihilism,” were common. Further evidence of this trend, both concrete and symbolic, comes from an internet survey about changes in social attitudes (DIMS-DRIVE Inc. 2012). Among those who live alone, almost 50% reported that they are now thinking about getting married or finding a partner—a boyfriend or girlfriend.

This new attitude is often seen as a socio-cultural and socio-psychological consequence of the disaster of March 11, 2011. Another interpretation is that it is simply attributable to the “disaster culture” (Button 2010) that Japan has developed, almost as a hidden cultural gene. During this disaster, many villages and towns demonstrated effective community coping capacity, surprising many who had believed that cooperative and collaborative power had weakened over the years, reflecting not only increasing modernization and urbanization, but also rural population decline.

Sankei Sinbun (2011), a national newspaper, reported that, only three weeks after the Great East Japan Earthquake Disaster, the

stricken isolated community of Minami San-riku-Cho, Miyagi Prefecture, had implemented a program to divide scarce foodstuffs among all households. The villagers explained that, based on a relationship of trust, they were honoring each other by enabling their village to work at maximum strength.

CNN (2011) reports also confirm Japan's community-rooted sense of order, a cultural characteristic that becomes active during times of extreme stress. It was noted that one layer of human turmoil—the looting and scuffling for food or services that often follows a disaster—is noticeably absent in Japan:

“Looting simply does not take place in Japan. I'm not even sure if there's a word for it that is as clear in its implications as when we hear 'looting,'" said Gregory Pflugfelder, director of the Donald Keene Center of Japanese Culture at Columbia University. Japanese have “a sense of being first and foremost responsible to the community,” he said.

In fact, the ability of Japan's traditional neighborhood communities to cope with crises is so well-established that it is natural to ask whether they function only during or after a disaster.

The answer is “No.” Japan's sense of community organization facilitates cooperation and collaboration even in normal (non-disaster) times. In particular, the tradition of cooperation and collaboration for disaster reduction at the community level has been applied not only to disaster response, but also to disaster preparation and mitigation. This Special Issue focuses on attempts to understand this impressive cultural phenomenon, and suggest ways to reinforce it.

3 Self-Reliance, Group-Reliance, and Assistance

To understand disaster planning and management in Japan, one must understand the contrast among “Kyojo” (Neighborhood or Community Self-Reliance), “Jijo” (Individual or Household Self-Reliance), and “Kojo” (Government Assistance). As Fig.1 illustrates, these concepts overlap. Japan is doing its best to increase both Kyojo and Jijo self-reliance roles, and to depend less on Kojo, which in the past was the major agent to mitigate disaster.

Even though major disasters are rare, their frequency in Japan is great enough that considerable effort has applied to studying how to reduce their impacts. Japan's disaster planning and management policy changed significantly after the Great Hanshin Awaji (Kobe) Earthquake of January 17, 1995. Table 1 contrasts the approaches before and after this cataclysmic event. The current approach stresses strategies that are proactive, anticipatory, precautionary, adaptive, participatory and bottom-up. The rationale is that governments have been found to be of relatively little help immediately after a high-impact disaster. Lives in peril have been saved by the actions of the individuals them-

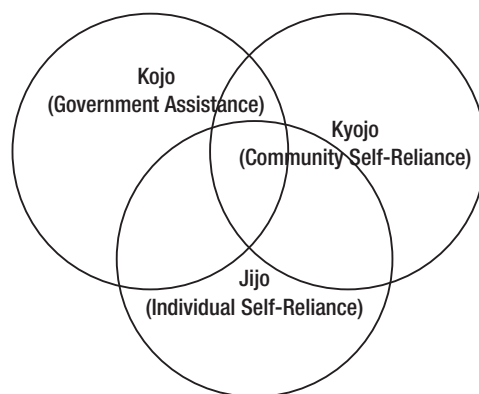


Fig. 1 Three types of assistance for disaster risk reduction

Table 1 Conventional disaster planning versus twenty-first century integrated disaster risk management (based on Okada 2006)

Twentieth century	Twenty-first century
Reactive	More proactive
Focus on emergency response and crisis management	Focus on risk mitigation and preparedness
Countermeasure manual approach	More anticipatory/precautionary approach
Predetermined planning (non-surprise)	More comprehensive policy-bundle approach
Sectoral counter measure approach	More adaptive management approach
Top-down	More bottom-up

selves and their neighbors. Unfortunately, the relative lack of success of local governments in disaster reduction was again clearly evident during the 2011 Great East Japan Earthquake Disaster.

4 Community-based Disaster Reduction: Jishu-bosai-soshiki Versus Machizukuri

Japan has a long history of participatory community disaster risk management. Long before the 1995 Kobe earthquake disaster in Japan, community organizations known as Jishu-bosai-soshiki (Self-support Disaster Reduction Association) flourished. Originally their orientation was more toward post-disaster emergency management, such as rescue and relief as well as self-evacuation. After 1995, these community associations were encouraged by their local governments to improve preparedness and encourage proactive action at the community level. In a study of the roles and characteristics of these organizations, Bajek et al. (2008) concluded that they tended to be guided and mobilized by local governments, and that their aim was to supplement expected government actions, rather than to find ways reduce disaster risks in residential areas. This conclusion suggests that cultural factors may be involved in community cooperation and col-

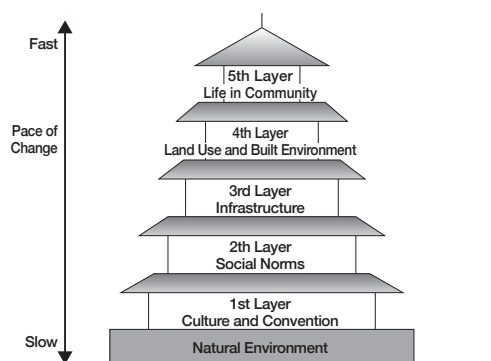
laboration in Japan.

In contrast to Jishu-bosai-soshiki, another approach to neighborhood-level disaster reduction is now more common. The “Machizukuri” (citizen-led town-creation) approach includes many local initiatives aimed at reducing disaster risks or mitigating disaster effects in a community. Okada (2012b) compares machizukuri with “toshikeikaku” (urban or city planning)—see Table 2. Machizukuri is citizen-led and non-administrative, while toshikeikaku is administrative and based on a legal framework. Both are intended to improve the common spaces where people live and work. From the viewpoint of disaster risk reduction, the difference between jishu-bosai-soshiki community activities and the machizukuri approach is that the latter is holistic, multi-focused, and broader in scope—often not limited to “disaster concerns.” Moreover machizukuri is citizen-led, involves multiple stakeholders, and takes account of day-to-day issues instead of focusing on one-time problems.

Okada (2012b) proposed systematic conceptual models for understanding the machizukuri approach. Figure 2 illustrates the multi-layer common spaces (an extension of the concept of infrastructure) for a city, region or neighborhood community as a living body (Okada 2004). In the context of this diagram, machizukuri is more appropriately applied on a neighborhood

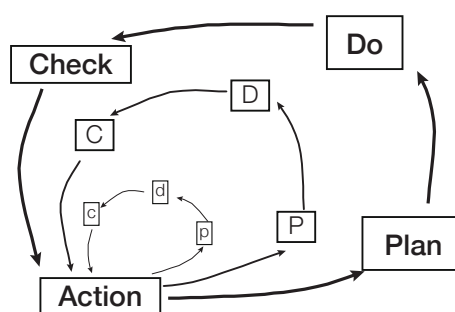
Table 2 Machizukuri versus Toshikeikaku

Machizukuri approach	Toshikeikaku approach
Led by citizens. Requires a local leader or champion. Participatory	Led by government. Administrative and based on law
May be self-financed or publicly financed. Voluntary	Publicly-financed. Project-based with a set time span
Holistic	Specialized/sectionalized
Not necessarily space-specific	Spatial planning and management

**Fig. 2** Cities/regions viewed as spatial-temporal multi-layer system

community scale, rather than on a wider scale, such as city or region. Applied to a neighborhood community in the context of a five-storied pagoda model, it starts with the fifth layer (daily life), followed by the fourth (land use and built environment), and the third (infrastructure). By comparison, toshikeikaku focuses mainly on the fourth and third layers. Another point of contrast is that machizukuri requires citizen involvement to induce attitudinal or behavioral change, while this issue is not essential for toshikeikaku.

The dynamic processes implementing such a change can be explained and systematically modeled by the nested Plan-Do-Check-Action (PDCA) cyclic structure, as shown in Fig. 3. Okada (2012a) proposed this structure as a positive adaptive management system, and successfully applied it to various machizukuri field-

**Fig. 3** Nested structure of PDCA (small, medium, and large)

based “social experiments” to change people’s attitudes and actions.

5 Overview of the Special Issue

The above findings can be put into a group decision and negotiation perspective. Both jiishu-bosai-soshiki community activities and machizukuri for disaster risk reduction are modeled as community-based decision making systems for disaster management. They are participatory approaches for communities at risk that usually involve multiple stakeholders including individuals, households, community subgroups, non-governmental organizations (NGOs), academics and government officials.

The paper by Yamori (2012) presents a disaster prevention game called *Crossroad*

for community-based decision making and brainstorming/image training for postdisaster emergency management. Crossroad incorporates dynamic processes involving experiencing and reflecting on a collection of individual-level dichotomous (Yes/No) scenarios requiring choices (decisions) for each scenario. It provides a tool for virtual learning about path-dependent, viable solutions, and encourages users to consider possible choices not taken.

A participatory method to support group decision making, the *Yonmenkaigi System Method* (YSM), is described by Okada et al. (2012). YSM applies to community-based decision-making, and emphasizes social implementation for pre-disaster risk reduction. It incorporates dynamic processes to collaboratively develop implementable actions, and involves four role-playing groups. Adaptive management is achieved through win-win debating to develop a collaborative action plan. The focus is on the synergistic process of collaborative development for mutual learning, decision making and capacity building.

The paper by Sakakibara and Kimura (2012) presents an experimental study in which conflict participants' behavior was observed and assessed. Coordination through negotiation and facilitation for social development—not limited to disaster management—is investigated through the game experiment. The experiment is based on three different two-player strategic-form games, including (i) win-win, (ii) win-lose, and (iii) indifferent-win games, which themselves are to be further coordinated. The effect of negotiation and the role of the facilitator in improving coordination are studied.

6 Conclusion

Community-based decision making is effective even when individuals are competitive, provided that the conflict does not overwhelm their shared interests. Special situations such

as disaster, crisis, accident, and community-issue management inevitably require some form of cooperative or collaborative mechanism. Because Japan has long experienced—and survived—such crises, it has developed a significant disaster culture. Thus, Japan provides ample examples of effective community management and participatory methods to support group decision and negotiation. There is no reason for these methods to be limited to Japan; we believe that they can be tailored to other countries, especially those that are prone to similar disasters, crises, and accidents. Community-based management is needed to solve the problems of communities—an observation that is true everywhere in the world. This special issue provides readers with an opportunity to understand and appreciate community-based decision making in Japan, with its special focus on disaster management.

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