A COMMUNITY PARTICIPATORY MAPPING AND ADVANCED SAFETY IMPROVEMENT PROJECT IN KOREA

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ABSTRACT:
This study has two topics. The first topic concerns collaboration among projects, including the integration of similar safety projects, promoted for projects that are near or similar to each other. It is believed that such collaboration or integration of governmental projects can improve efficiency through the synergy effect and it can avoid project duplication and decrease budget waste. However, there are no legal policies of the relevant Ministries regarding integration or collaboration of similar projects, except for the "Safety Policy Coordination Committee of Ministry of Public Safety and Security," which is authorized to mediate among governmental projects. Therefore, legal revisions to address integration or collaboration processes are needed. The second topic is participatory safety community mapping (PSCM) that supports citizen participation in local safety improvement projects. The first step of a PSCM is survey and classification of hazardous factors in the living environment by the local residents. In this study, the feasibility of PSCM was investigated through a pilot PSCM program conducted with two students groups. Students voluntarily participated in the program and results of the analysis found students' interests in safety or risk factors in their living environments increased. In addition, students' consensus on safety improvements made them more active safety community members. Hence, the students participated in an ideas competition of the Ministry of Public Safety and Security and won first prize. In conclusion, PSCM is an adaptable tool as a first step in the collaboration or integration process of governmental projects.

KEYWORDS:
participatory safety community mapping, safety improvement project, Safety Village, local community governance, safety project integration

1. INTRODUCTION

Over the past decade, Korean lifestyles have become more diverse and, as Korea's economy has grown, numerous advanced technology products have been added to people's living environments. Along with that change, the level and quality of public safety has increased. Moreover, increases in the numbers of human-induced problems, such as sex crimes, the 2015 hydrofluoric gas leakage at Samsung Electronics Co.'s plant, and the 2014 Sewol ferry disaster, have increased public anxiety and distrust in the government.

However, the variety and quantity of hazards and risk factors in the living environment are numerous and the government cannot feasibly monitor or mitigate all of them because it lacks the manpower and money to do so. Therefore, there always will be some extent of risk and hazard in the living environment. In this context, citizen participation in safety improvement projects has been suggested in projects such as the "Safety Village" proposed by the Ministry of Public Safety and Security.

In this study, a risk monitoring methodology, referred to as "Participatory Safety Community Mapping" (PSCM),
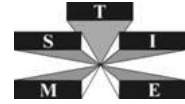
and a participatory safety improvement system are suggested to support citizen participation in safety policies. In addition, collaboration that includes the integration of similar and/or proximate safety projects is examined as a way to improve the efficiency of the integrated projects' results.

2. ISO 31000 AND LIVING SAFETY MANAGEMENT SYSTEM

This study examines the ways that citizens participate in monitoring hazards in and near their living environments and the ways that these citizens' activities could be connected to safety management systems, such as the "Safety Village," which is a safety improvement project of the Ministry of Public Safety and Security.

2.1. Introduction of ISO 31000 for Participatory Safety Management

According to Wikipedia (https://en.wikipedia.org/wiki/ISO_31000), ISO 31000 is a family of standards relating to risk management codified by the International Organization for Standardization. The purpose of ISO 31000(2009) is to provide principles and generic guidelines on risk management. ISO 31000 seeks to provide a universally recognized paradigm for practitioners and companies employing risk management processes to replace the myriad of existing standards, methodologies and paradigms that differed between industries, subject matters and regions.

Currently, the ISO 31000 family is expected to include:
ISO 31000(2009) - Principles and Guidelines on Implementation,
ISO/IEC 31010:2009 - Risk Management - Risk Assessment Techniques,
ISO Guide 73:2009 - Risk Management – Vocabulary

ISO 31000 was published as a standard on the 13th of November 2009, and provides a standard on the implementation of risk management. A revised and harmonized ISO/IEC Guide 73 was published at the same time. The purpose of ISO 31000(2009) is to be applicable and adaptable for "any public, private or community enterprise, association, group or individual." Accordingly, the general scope of ISO 31000 - as a family of risk management standards - is not developed for a particular industry group, management system or subject matter field in mind, rather to provide best practice structure and guidance to all operations concerned with risk management. Figure 1 shows ISO 31000 Risk Management Principles, Framework, and Process.
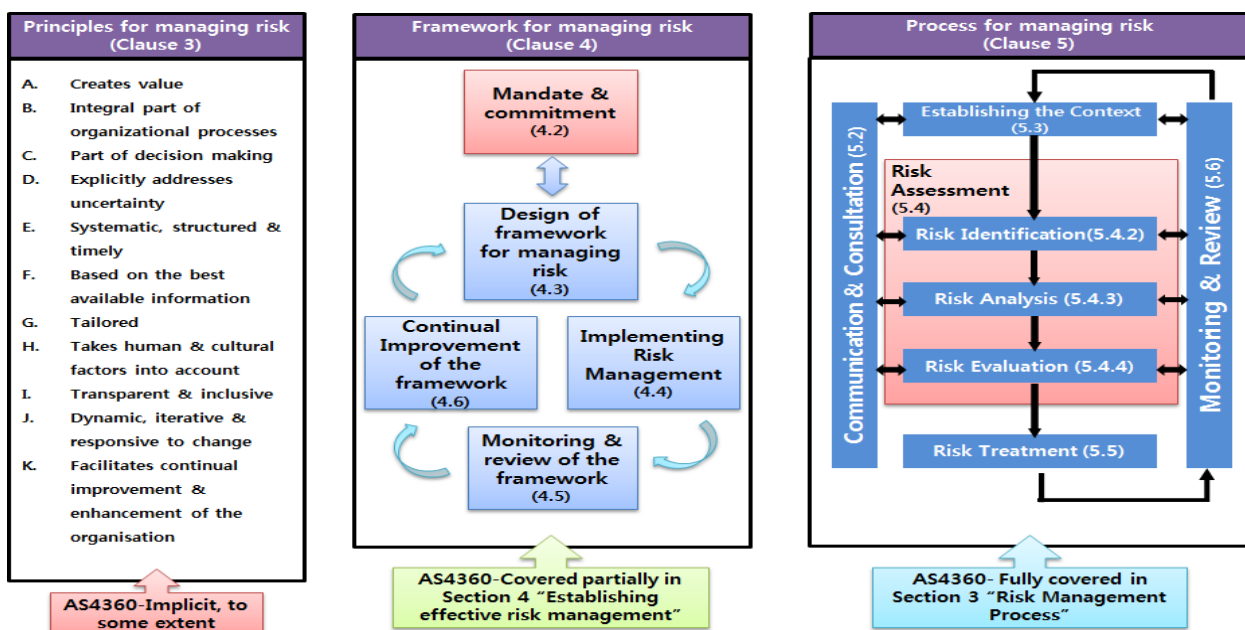

Figure 1 ISO 31000 Risk Management Principles, Framework, and Process

2.2. Application of ISO 31000 Risk Management System to Participatory Safety Management

In this section, a citizen participatory safety management system is suggested using the ISO 31000 risk management process. As shown in Figure 2, introducing PSCM as the first step can start the safety management process. The focused safety management contents and risk factors of the living environment can be established from the PSCM statistical hit counter. Statistical hit counters can be derived from citizen input data on hazards in and around their living environments through PSCM. Then, risk identification and analysis are possible. Based on the analytical results, a risk treatment methodology to mitigate the risk factors should be chosen by the local safety community government. Safety community governance comprises citizens, local civil servants, and safety experts. As the last step of the risk treatment, mitigations are applied in local governments' safety improvement projects, such as "Safety Villages." Details of the PSCM and the Safety Village project are explained below.

Because this safety management system is based on the ISO 31000 risk management process, the most important difference is the citizens' participation in monitoring the hazards and the safety improvement projects. Citizen participation is very helpful for revealing the risks in and proximate to living environments and to mitigate accidents, which can cause disasters in dead zone.
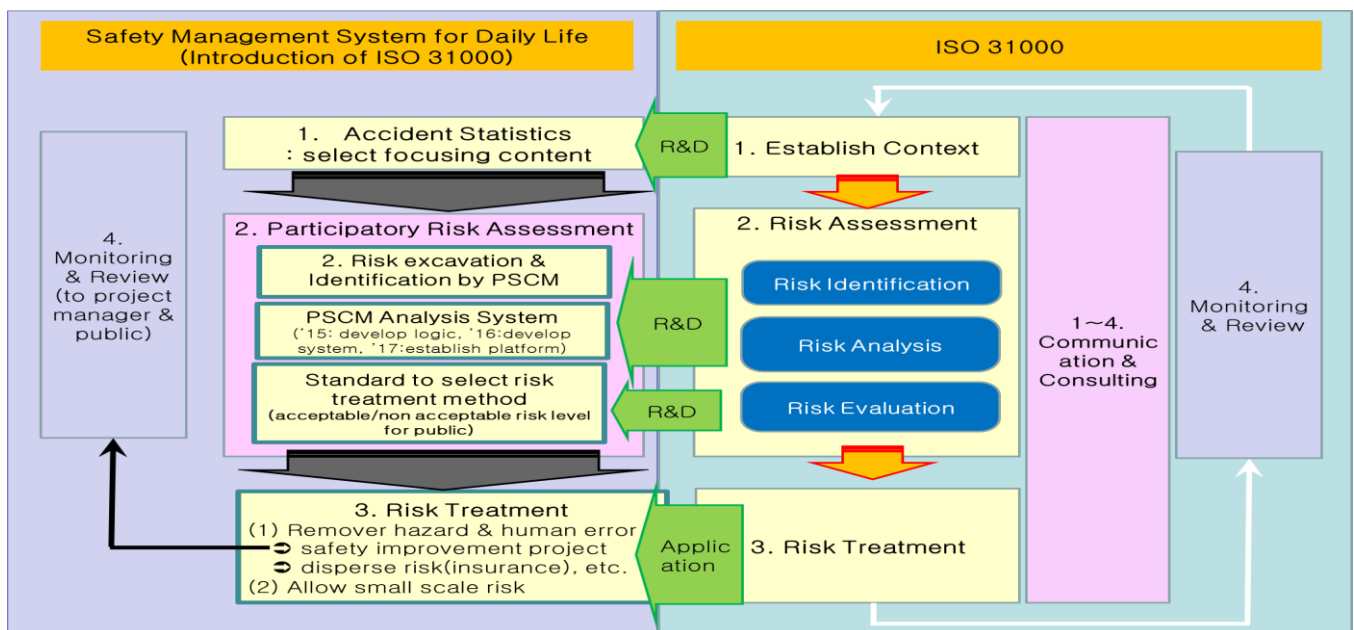

Figure 2 Participatory Safety Management Systems Using the ISO 31000 Risk Management Process

3. PARTICIPATORY COMMUNITY MAPPING: RISK SCANNING IN DAILY LIFE

After the launch of the Park Geun-Hye government, the Ministry of Public Safety and Security changed its safety policy from a top-down to a bottom-up approach; that is, citizens now participate in governmental business and cooperate with the government to improve local area safety. For example, citizens can discovering and share information about hazards in their living environments and government can remove these risks based on the provided information. This approach is expected to induce citizens to have more interest and pride in safety policies.

PSCM is a process by which community members discover hazards and share that information with the community via photos or texts linked to location-based maps. The risk communication with community members allows safety improvement decisions to be made. Therefore, risk communication is a type of PSCM. Community mapping is a composite word of a community and making a map. PSCM results tend to widely vary because of differences in
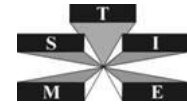
communities' characteristics, such as the levels of expertise and public interest.

Figure 3 shows the results of PSCM with a school club community. Students discovered five things for safety mapping: (1) crime and security, (2) disasters, (3) transportation and pedestrian safety, (4) dangerous or safe facilities, and (5) raincoat man. As shown in Figure 3, a statistical hit count can be easily drawn using the mapping results, which was useful for creating a safety improvement plan for the school zone and its proximity.
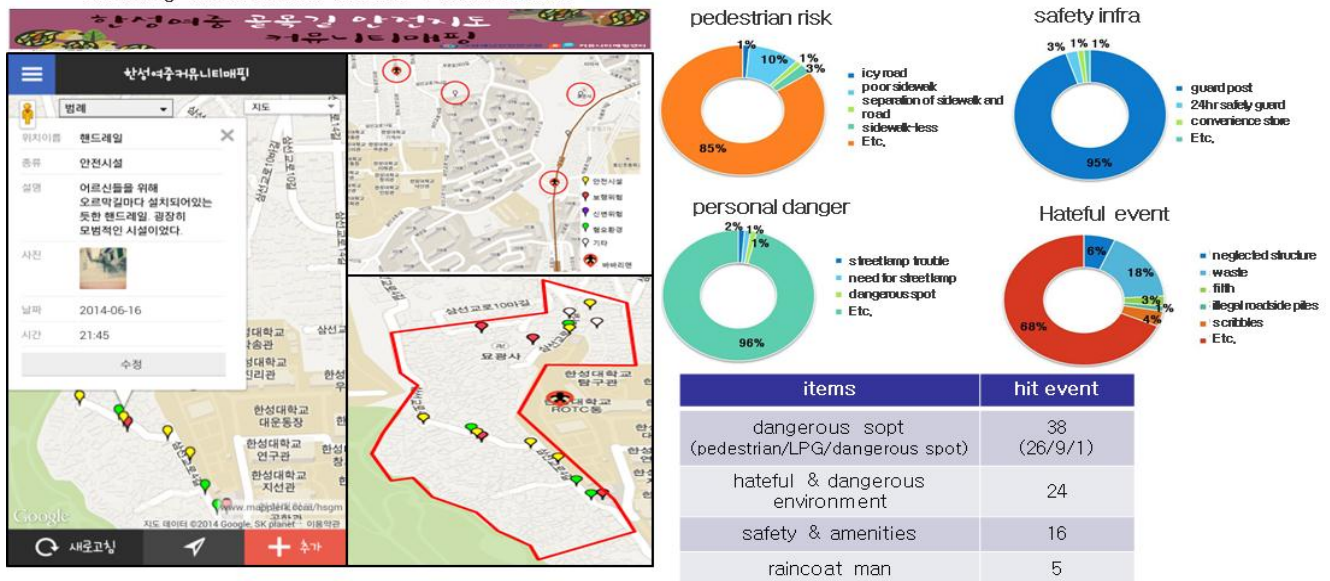

Figure 3 PSCM Results and a Brief Risk Factors Statistics around HanSeong Middle School

Figure 4 shows the safety improvement contents and lists (paper map) in SongJuk-dong, where the "Safety Village Project" moved ahead as a government project in 2014. The residents of SongJuk -dong created the lists and contents through their field activities. Similar to Figure 4, creating a paper map could be a PSCM activity performed offline. If there is no online mapping tool (mapping platform) for the community, a "paper map" is useful for grasping local risks. However, it was found that there are a few limitations to accessibility and sharing with the community using paper. On the other hand, online community mapping is not limited in information accessibility or sharing among community members, although it needs a platform, such as a community mapping application or website, and community members who are trained in its use.

Generally, most people believe that safety-related governmental projects intended to protect citizens' safety are the government's responsibility. However, numerous risks in and around living environments persist and the government
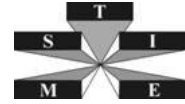
cannot monitor and manage all of them because of manpower and budget limitations. Therefore, many risks that can cause disasters or accidents are not being addressed. PSCM is needed in these cases. The analysis of the pilot PSCM tests with the school groups and SongJuk-dong safety improvement project found that risk information about the living environment was shared voluntarily and safety improvement ideas were extracted by the citizen participants in the discussions about how to improve conditions or remove risks. These ideas can become part of the project contents of the Safety Village. From these positive results, the potential that a community can become a safety community was verified. In addition, PSCM can be an effective way to engage citizens' in safety improvement projects.
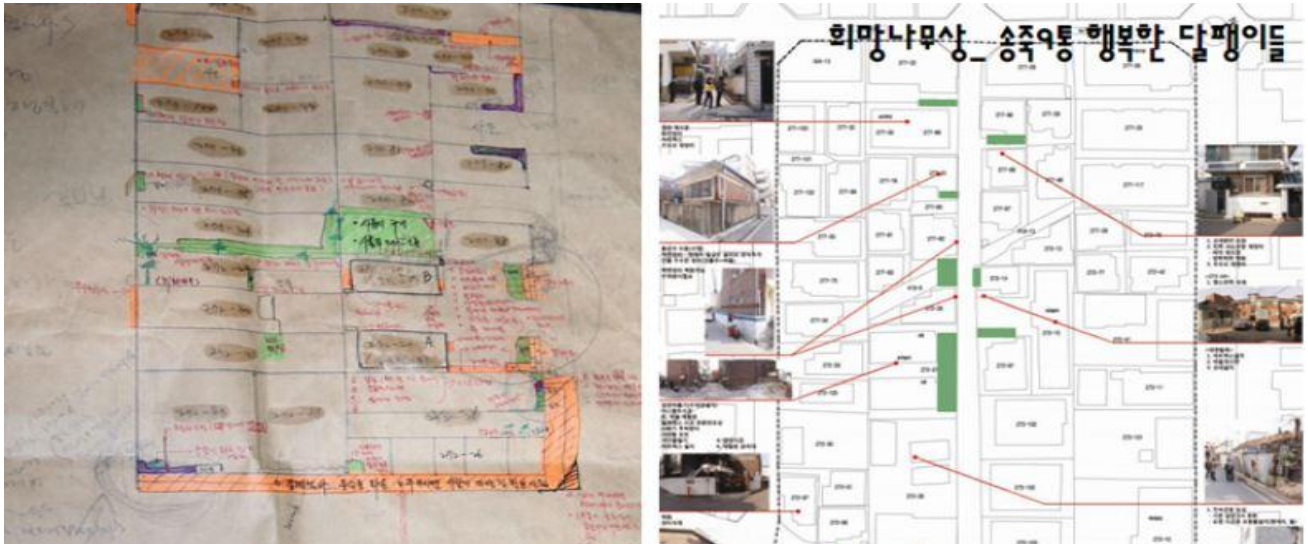

Figure 4 Concepts Map for Hazards and Safety Improvement Contents of SongJuk-dong Safety Village Project

4. CITIZEN PARTICIPATION SAFETY IMPROVEMENT PROJECT: "SAFETY VILLAGE"

A Safety Village is an advanced safety improvement project of the Ministry of Public Safety and Security that is a citizen participation program. The implementation process of a Safety Village is shown in Figure 5. Residents participate in all of the steps, except for the evaluation of the project's results. First, the local residents establish a safety community for themselves and expand their community's scope to the local government as part of the local safety community. Next, the community conducts a PSCM and determines the hazard factors specific to that village. Then, the safety community devises a safety improvement plan for the village. After the experts and government review the plan, the Safety Village plan is revised by the safety community. Last, the local safety community, including residents, implements the plan to improve village safety.

Figure 6 shows an example of the contents of a Safety Village Project that was conducted in 2014 by the Ministry of Public Safety and Security. These contents can be extended to include other items, depending on a village's environmental conditions and characteristics, such as topography, vulnerable populations, infrastructures, and the natural environment.

The Ministry of Public Safety and Security determined the scope of Safety Village Projects in 2015 and the development direction was given as follows (Table 1). First, individual safety will lead to family safety and expand to cover villages' safety. Village safety leads, in turn, to national safety and village safety secures the foundation of national safety. Second, standard guidelines and a basic model of a Safety Village should be determined and gradually applied across the country. Third, farming and fishing villages will be focused on in the early stage of implementation.
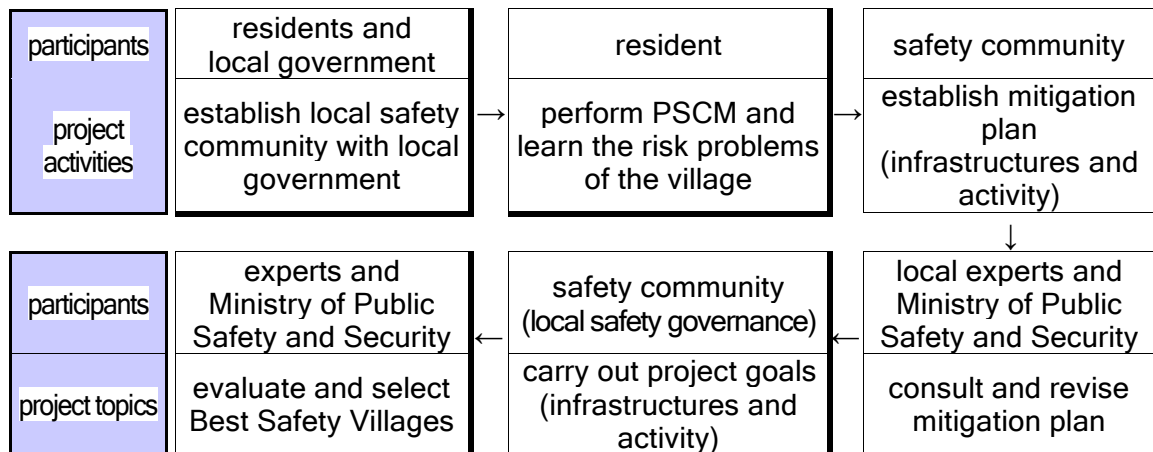
participants	residents and local government	resident	safety community
project activities	establish local safety community with local government →	perform PSCM and learn the risk problems of the village →	establish mitigation plan (infrastructures and activity) ↓

participants	experts and Ministry of Public Safety and Security	safety community (local safety governance)	local experts and Ministry of Public Safety and Security
project topics	evaluate and select Best Safety Villages ←	carry out project goals (infrastructures and activity) ←	consult and revise mitigation plan

Figure 5 Implementation Procedures of Safety Village Project

Table 1 Project section and contents of Safety Village

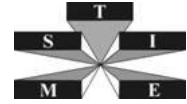|		content cases of Safety Village
common section		(infrastructures) base camp, warning system, dangerous area barriers, information signs, and similar communications (activity) community establishment, safe map (PSCM), training and education, hotlines, evacuation routes and designated shelters designation, and similar activities
disaster mitigation	storms and floods	(infrastructures) drainage pumps, river maintenance, "danger" signs, maintenance, and other structures (activity) dangerous area patrols, drainage channels cleaning, rain gutter cleaning, emergency stockpile reserves
	landslides and collapses	(infrastructures) maintenance of steep slopes, cutting areas, and old fences, and other hazardous areas (activity) patrols, rain inflow prevention, village officer designation, and other organizing activities
	droughts, heavy snows, and other similar weather events	(infrastructures) developed wells, secure and maintained water collection places, snow removal equipment, and other equipment (activity) protection of water collection places, designation of the management section control, and other related activities
living safety	crime and security	(infrastructures) security maintenance, revive streetlights, deserted houses and alleys, CCTV, emergency sirens, security guard posts, and other crime prevention structures (activity) join SOS safe return service, security patrols
	transportation and pedestrian safety	(infrastructures) install school vehicle platforms and speed bumps, road alignments, install guardrail, and other road safety devices (activity) establish pedestrian network, enforce illegal parking penalties, assist pedestrian safety at crossroad, and related precautions
	e.g., vulnerable groups protection	(infrastructures) defibrillators, unmanned home delivery boxes, emergency vehicle traffic flow improvements, school hygiene cleansing zoning (activity) safety checks for electrical and gas facilities, building cooperation networks with relative organs

improvement safety infrastructures	
safety activities	
focused infra for natural disaster damage reduction	

Figure 6 Sample Contents for Safety Infra and Activities of a Safety Village

5. INTEGRATION OF SIMILAR SAFETY IMPROVEMENT PROJECTS

Integration of or collaboration among similar projects is anticipated so that the governmental projects can proceed efficiently because of the synergy effect of such integration. In addition, by avoiding duplicated investment across different departments, budget waste can be decreased.

The first step of a PSCM is survey and classification of the risk factors in a living environment. PSCM is one of the most important processes of a safety improvement project because most of the risks are listed by the community residents and an appropriate safety improvement plan to mitigate those risks also are considered by the local safety community. Therefore, through a PSCM, projects with similarities can be integrated into one project or redesigned as collaborative projects. Figure 7 shows the process by which project contents are derived from a PSCM and the way that verification of the integration process of similar projects is achieved through PSCM and use of the list of safety
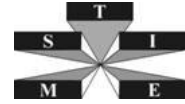
improvement contents. For a more detailed description of the safety improvement project, please refer to Table 1 and Figure 6.

However, we could not find institutionalized policies in the relevant Ministries regarding integration or collaboration of projects, except for one political process, the "Safety Policy Coordination Committee of Ministry of Public Safety and Security," which can mediate government projects among departments. Hence, the authority of the "Safety Policy Coordination Committee" and related laws should be reviewed.
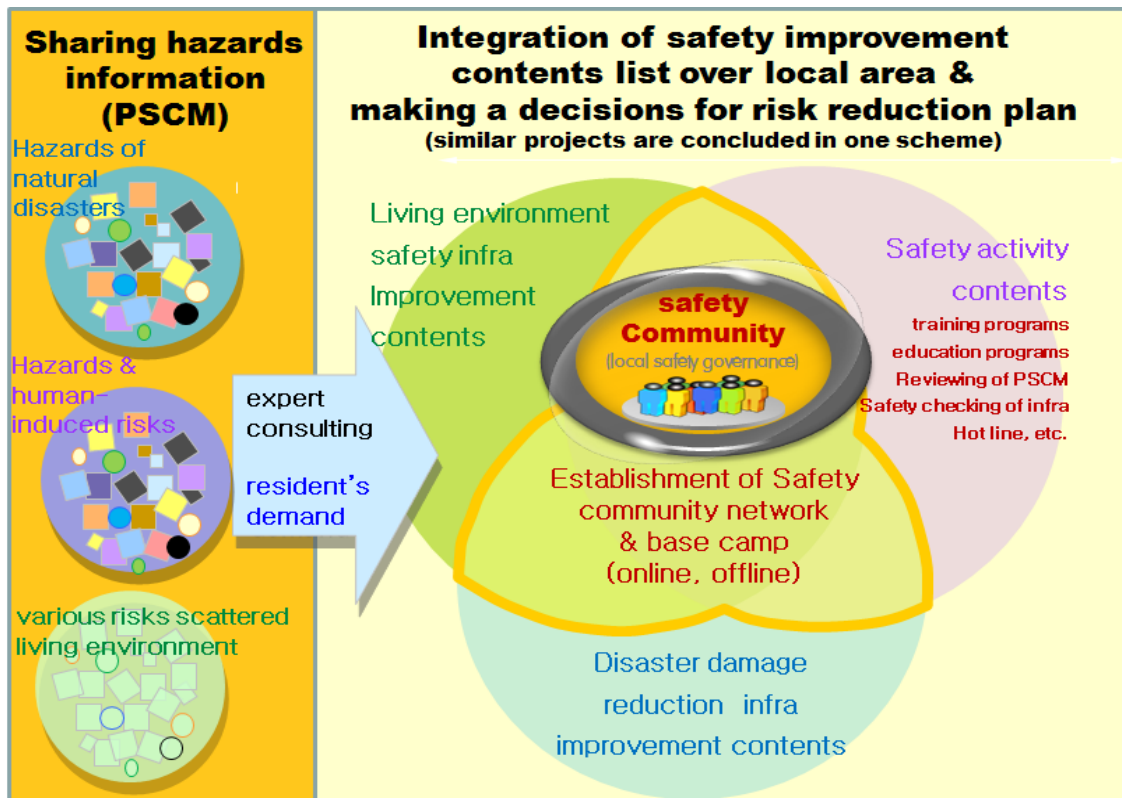

Figure 7 PSCM and Integration of Similar Projects from Safety Improvement Content Lists
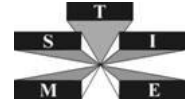
6. CONCLUSION

In this study, the value of citizen participatory community mapping for community safety and the effectiveness of PSCM methodology as a citizen participation tool were examined through the analysis of pilot PSCM activities with students groups. PSCM was verified as an efficient way to activate citizen participation. The significance of PSCM and the Safety Village is as follows.

(1) PSCM guarantees residents participation in Safety Village creation as facilitators.
(2) Residents and government work together to build local safety networks and public-private partnerships as the projects proceed.
(3) The residents involved in Safety Village creation are expected to increase their levels of interest in and responsibility for the safety of their living environments. Residents learn about risk factors, how to improve safety, and gain a sense of consensus about safety improvement.

Based on these conclusions, PSCM should be applied and promoted as a way to improve safety in the beginning stages of Safety Village Projects. The results suggest that citizens participate in Safety Village Projects voluntarily and participation enhances their safety capabilities. Furthermore, numerous risks in the living

environment that government cannot manage because of manpower and budget limitations can be monitored through PSCM.

In conclusion, the "Safety Village Model & Guideline" should be created and distributed to every local government and laws regarding integration of similar safety improvement projects are needed to disperse safety improvement projects efficiently and effectively throughout the country.

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