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Importance of communication and knowledge of disasters in community-based disaster-prevention meetings

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ABSTRACT

This study examines the importance of communication and other relevant factors in community-based disaster-prevention meetings (CDPMs) by focusing on participants' satisfaction with these meetings, which was assessed using a questionnaire survey. CDPMs in Kitakyushu City were selected as a case for this study and the analysis was conducted using statistical methods called Structural Equation Modeling (SEM). The results showed that for effective CDPMs, knowledge and understanding of disasters and community are important factors; however, more importantly, an effective relationship and communication with local communities is an essential factor. In other words, for CDPMs, it is important to increase not only the understanding of disasters but also human interaction and communication between different generations.

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1. Introduction

In order to reduce the number of victims of natural disasters, promotion of early evacuation, education about disaster prevention, and establishment of a system whereby residents can evacuate on their own volition are important. Involving local communities in risk reduction or disaster management activities is challenging in countries with top-down government and authority structures (Buckland and Rahman, 1999; Pearce, 2003; Allen, 2006; Hosseini et al., 2014). Sharing information on natural disasters with residents can serve to establish a community-based voluntary evacuation system and disaster-prevention network before an actual disaster situation.

Hosseini et al. (2014) showed that emergency response measures for major disasters cannot be implemented without mobilizing local people. They also highlighted the importance of community-based activities in reducing disaster risk and evaluated the possibility of involving community members in risk-reduction activities. The results of this current study show that activities that do not involve enough communication among local residents were difficult to implement in the short term and were considered unrealistic. However, after providing relevant materials, such as disaster maps or plans, the community found novel ways to

improve their capabilities for reducing disaster risk and properly responding to disasters. In addition, Hosseini et al. (2014) found that all participants, especially the younger generations, have a more flexible attitude toward disaster management within their local community. Their findings also revealed that if the community and local entities have a good leader, the activities for disaster-risk reduction are more likely to be successfully implemented.

Armed with this awareness, community-based disaster-prevention activities and meetings have been conducted nationwide in Japan. This study focuses on Kitakyushu City, which has been conducting the "Urban Development Promotion Project for Disaster Prevention by Everyone (Minna de Bousai machi-zukuri)" since 2013, and has held approximately five community-based disaster-prevention meetings (CDPMs) in four districts in the city. In this example, by involving not only local residents but also local university students who have some knowledge about natural disasters and by increasing awareness of the disaster-prevention-plans' objectives and system of implementation, smooth communication in the meetings was ensured and their quality was improved.

This study examines the importance of communication and other relevant factors in CDPMs by focusing on participants' satisfaction with these meetings, which was assessed using a questionnaire survey.

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2. Literature review: studies on community-based activities and meetings for disaster prevention

Mushkattel and Weschler (1985) stated that the governance of emergency management should be shared across different levels of the government and among different sectors, thereby reducing the burden on any single agency. In addition, local and community capacities should be enhanced, as metropolitan emergency management operates primarily at this level. Citizens' behavior and emergent groups are not limited to individual efforts in disaster response (Kapucu, 2012); rather, community-based activities based on citizen initiatives play an important role in multiple aspects of disaster prevention. These initiatives are not only involved in preparedness and response efforts but also provide financial support and medical services (e.g., blood donations) in the aftermath of catastrophes (Kapucu, 2012; Stallings and Quarantelli, 1985). According to Pearce (2003), while examining the relationship between disaster management and community planning, two kinds of phenomena should be considered: (1) planning activities that occur before the disaster (i.e., mitigation), and (2) activities that occur during or after the disaster. Mitigation activities occur in all phases of disaster management and are usually conducive to cooperation and coordination between disaster managers and community planners. For example, most communities have official plans that plot their progress and future development. Discussions around these plans should include local disaster managers as well as community planners. This is especially important with regard to schools, hospitals, and other critical facilities. As communities retrofit existing infrastructure, disaster managers and community planners should be directly involved in discussions and decision-making.

Community-based activities can be observed in countries such as Japan, Iran, Turkey, Nepal, Australia, and the United States. Hosseini et al. (2014) introduced the following examples:

In Katmandu, Nepal, several community-based groups exist for empowering the residents and promoting public participation in disaster response. Their plan components include estimating the disaster risk at the community, planning for risk reduction, promoting public awareness, empowering local communities for potential earthquakes, and making necessary basis for emergency response at the community level. In Indonesia, after the 2004 Indian Ocean Tsunami, some foundation implemented some projects for relief and reconstruction of affected areas in Aceh and North Sumatra by the assistance of local religious community-based organizations. This program consisted of three parts: providing protection and safety for survivors, creating rapid response units, and developing emergency aid for rebuilding the damaged areas. All of these parts were implemented using local residents' capacities. Some community-based organizations were also established in Australia aiming to raise the awareness of residents on disasters and their consequences; to promote coordination and support in disaster management; to expand cooperation among authorities and residents in disaster management; and to improve coordination in using all resources in the rehabilitation phase.

The number of community-based disaster-management organizations in Japan has increased during the last two decades, especially after the Great Hanshin-Awaji Earthquake of 1995. The importance of disaster-prevention activities and education for children was also widely recognized among the residents in the area. Ishizawa et al. (2000), Ishizawa and Midorikawa (2001), and Fujiwara and Onishi (2002) reported on the status of disaster-prevention activities at schools, with Shigekawa (2003)

reporting some practical examples of disaster-prevention meetings where university students and volunteers worked together with the children of the area on disaster-prevention monitoring and the creation of a disaster-prevention map.

In addition to the introduction of the above activities, Kanai et al. (2005) evaluated the participants' satisfaction with the activities and the acquisition of target actions. They went a step further to study the ripple effects of the activities, specifically by targeting elementary school students and their guardians, then analyzing the effects of the education-based activities on evacuation from tsunamis. They found that educational activities on disasters not only improve children's understanding about disaster evacuation but also increase opportunities for conversation between parents who are anxious about their children's safety.

Toyosawa et al. (2010) utilized the framework of threat appeal to investigate the possibility of a change in children's feelings and recognition through disaster-prevention education by targeting elementary school students, and the possibility of an effect on guardians' disaster-prevention actions caused by these changes in children. By targeting 135 elementary school children from the fifth and sixth grades, they measured feelings and recognition changes before and after disaster-prevention education, and three months later, measured the changes in their fears, reaction effectiveness, and perceived vulnerabilities against and seriousness of the threats. Additionally, they measured their efficacy toward guardians, their intention to immediately transfer the acquired information to their guardians after disaster-prevention education, and the amount of transferred information to the guardians and their degrees of cooperation after three months. Results indicated some improvements in the children's awareness and recognition immediately after the education, but their levels returned to pre-education levels after three months had passed. Moreover, the result of Structural Equation Modeling (SEM) showed the following: incident of a threat and efficacy toward guardians improves the intention of children's communicating the contents of the disaster-prevention education to guardians; higher intention leads to actual communication; and more communication prompts more disaster-prevention actions.

Kanai et al. (2006) investigated the effects of a disaster-prevention activity to understand not only the change in disaster awareness and actions for disaster risk preparation of the local residents of a target community but also the differences with a neighboring community where the activity was not conducted. Their study showed that the local residents of the model community, who created disaster maps and organized a volunteer evacuation system, depended less on hardware facilities and official disaster information from the government than before, and had an increased intention of self-help and community cooperation for disaster risk. Conversely, in the neighboring community where the activity was not conducted, the local residents who knew about the activity showed some improvements in their awareness.

3. Case study and data

3.1. Community-based disaster-prevention meetings in Kitakyushu City, Japan

CDPMs in Kitakyushu City were selected for this study to examine the roles of CDPMs with a focus on the satisfaction of participants. In this example, by involving university students in the meetings and increasing awareness of the objectives of the creation of disaster-prevention plans, smooth communication occurred in the meetings and improved their overall quality. This section provides the details of this example.

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