

# Increasing Earthquake and Tsunami Preparedness for Women and Elderly in Indonesia

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## Abstract.

Indonesia has faced many natural disasters after the great earthquake and tsunami hit Aceh in 2004. These disasters have affected men, as well as the women. However, the impact of disasters to women and elderly are worse than to men. Indonesia has policies and information kits for earthquake and tsunami preparedness, but it is still not well disseminated to the community, especially for women and elderly. This paper is focusing in increasing the knowledge of women and elderly in earthquake and tsunami preparedness in Indonesia, in order to reduce the numbers of its victims and death tolls. This is a literature review, based on the lessons learned from Japan. The study shows that optimizing the existing self-motivated group/ community organizations would be effective in order to increase the tsunami and earthquake preparedness for women and elderly in Indonesia.

**Keywords:** disaster preparedness, earthquake, tsunami, women and elderly.

## I. Introduction

On 26 December 2004, a 9.0 Richter scale earthquake hits Indonesia, followed by a massive tsunami that caused death and destruction throughout southern Asia and as far away as Africa. In case of Indonesia, as of 14 January 2005, there were 110,229 accounted for as dead; 12,132 as missing and 703,518 as displaced[1].

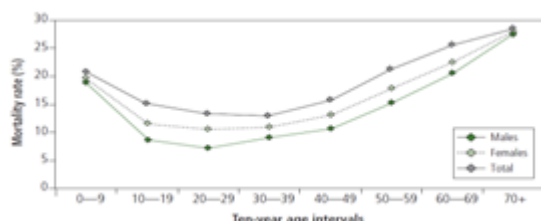


Figure 1. Age and Sex Specific Mortality Rates among Tsunami-Displaced Households

Based on the survey conducted in nine tsunami-affected districts in Aceh, between February and August 2005, 17% of the original

pre-tsunami population was reported as dead or missing in the tsunami. Moreover, this survey, which has been conducted in four areas (West Coast, Banda Aceh, Meulaboh and East Coast) also found that the highest mortality concentrating in the youngest children (aged 0–9 years) and oldest adults (70+). The risk of mortality was significantly greater among female than males as shown in Figure 1[2].

Tsunami in Aceh was followed with many natural disasters. The greatest one is Merapi's big eruption in Yogyakarta, in 2010 [3]. Therefore, Indonesia has developed policies and information kits for earthquake and tsunami preparedness. However, there are still some problems occurred in the implementation of these policies/ development plans. In general, it could be said that government, community and

all relevant disaster management stakeholders in Indonesia have not been prepared to deal with disasters. The Evaluation Report of The Implementation on National Action Plan of Disaster Risk Reduction [4] shows that the low participation of community in the disaster preparedness is a big issue, since the low knowledge of the community in the disaster preparedness have resulted in high numbers of victims and death tolls of the natural disasters in Indonesia.

Furthermore, Neumayer and Plümper have analyzed disasters in 141 countries and found that, when it comes to deaths, gender differences are directly related to women's economic and social rights. In societies where women and men enjoy equal rights, disasters cause nearly the same number of deaths in both sexes. They also confirmed that differences are the result of existing inequalities[5]. Therefore, it is important to increase knowledge of women and elderly in the disaster preparedness, as an aspect of disaster risk reduction in Indonesia.

This paper will be focusing in two problems: 1) identify the factors of effective earthquake and tsunami preparedness, based on the lessons-learned from Japan; and 2) analyzing the factors of ineffective community based preparedness for women and elderly in Indonesia. The objectives of this literature review are: 1) reviewing the policies and implementationsofcommunity based earthquake and tsunami preparedness for women and elderly in Japan; and2) discussing the recommendations on community based preparedness for women and elderly in Indonesia.

## **II. Increasing the Tsunami and Earthquake Preparedness for Women and Elderly**

Even though hundreds of thousands of lives were affected without warning by disasters yearly, most people do not concern themselves by preparing until disaster strikes. Therefore, it has become obvious that a more broad-based effort of behavioral change is required. Effective interventions to promote disaster preparedness require a thorough understanding of the factors that influence performance or nonperformance of disaster preparedness behaviors (DPB). Several theoretical frameworks can be employed in attempts to deal with behaviors that reduce the risk of natural disasters, including Theory of Planned Behavior (TPB). A central factor in the TPB is the individual's intention to perform a given behaviour, which determined by three preceding motivational factors: a) the attitude toward the behavior and refers to the degree to which the individual has a favorable or an unfavorable evaluation of the behavior in question; b) a social factor termed subjective norm; it refers to the perceived social pressure to do or not to do the behaviour; and c) the degree of perceived behavioral control which refers to the perceived ease or difficulty of performing the behavior. As a general rule, the more favorable the attitude and subjective norm toward a behavior, and the greater the perceived behavioral control, the stronger should be a person's intention to perform the behavior under consideration. Intention, in turn, is viewed as one direct antecedent of actual behaviour[6,7].

### **2.1. Lessons Learned from Japan**

At national level, Japan has the general Basic Plan for Disaster Management drafted by the Central Disaster Management Council, and the disaster management operation plans drafted by designated administrative bodies. At local level, there are Disaster Management Local Plans drafted by the prefectural and municipal Disaster Management Councils. Emergency

countermeasures are applied at the time of the specific disaster. The Basic Plan for Disaster Management, among others, has considered necessary disaster prevention measures for the elderly, the handicapped, infants and others requiring special [8].

After the Ise-Wan great tsunami, Japan developed Disaster Countermeasures Basic Act (Act No. 223, November 15, 1961). The main contents of the Disaster Countermeasures Basic Act are: 1) definition of responsibilities for disaster management; 2) disaster management organizations; 3) disaster management planning system; 4) disaster prevention and preparedness; 5) disaster emergency response; 6) disaster recovery and rehabilitation; 7) financial measures and 8) state of Disaster Emergency. This act also stated the responsibilities of residents and others residents of the area under local government, who are obligated to contribute toward the cause of disaster prevention by taking their own measures to prepare for disaster and by participating in voluntary disaster prevention groups etc.

Under the Disaster Countermeasures Basic Act, local public bodies are required to set aside a disaster countermeasures fund to cover emergency expenditure necessitated by disaster countermeasures. Specifically, they are required to save a specific sum of money, as a disaster relief fund under the Disaster Relief Law, for each of the prefectures they serve. Emergency funds are set up on a case-by-case basis.

Moreover, Japan also conducted educational programs related to disaster risk reduction in the public school system cover the age-range from 3 to 18 years. With a view to improve disaster risk reduction education at school, the Ministry of Education, Culture, Sports, Science and Technology is implementing policies such as

providing teachers with reference material to be used in safety guidance and planning evacuation drills, developing and distributing disaster risk reduction training materials focusing on how to prepare for and behave in the event of an earthquake or other natural disaster, and holding disaster risk reduction education training sessions (at the National Center for Teachers' Development). To promote a nationwide movement where individuals, families, communities, corporations and other various groups and entities participate in continuous activities and investments for mitigating disaster damage, in 2006 the Central Disaster Management Council published the "Basic Framework for Promoting a Nationwide Movement for Disaster Reduction - Actions with Added Value to Security and Safety."

In terms of community based disaster risk reduction, Japan used Jishu-bosai-soshiki, or Jishubo for short, literally meaning "autonomous organization for disaster reduction" is a neighborhood association for disaster preparedness and rescue activity at the community level in Japan. Whenever a local government wishes to organize any form of disaster preparedness events, such as drills, workshops, among others, it will make use of the Jishubo framework. Jishubo is a form of participation activity particular to Japan, and it differs from citizen programs on community disaster preparedness in other countries.

In the 'normal' times between emergency situations, member households are expected to organize disaster drills, educate residents, patrol their residential area and maintain rescue tools. During emergencies, Jishubo members guide refugees to a shelter, rescue residents, provide the initial first-aid and supply food and water. In accordance to its literal meaning, the organization (decision-making, functions, etc.)

of Jishubo should be left in the hands of community residents. However, in reality, local governments strongly urge communities to form Jishubo by providing a subsidy for purchasing emergency foods and rescue tools. The 'Basic Law on Natural Disasters' has made it the duty of the central and local governments to foster Jishubo.

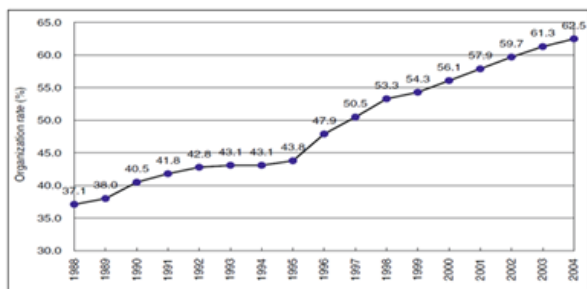


Figure 2. The Average Organization Rate of Jishubo

One of the reasons behind this common association with the community is based on Chonaikai, a Japanese traditional neighborhood governance system. Chonaikai, which can be literally translated into English as “community council”, plays an essential role as a community governance unit in Japanese society. The characteristics of Chonaikai are: (1) as a unit of household and compulsory participation; (2) as a traditional and uniform system over the country; (3) as a cooperative relationship between public sectors; and (4) as a base unit for daily and basic community events. The aspect of compulsory participation implies that Chonaikai is a “community governance unit”, but not an “association” organized to achieve a certain objective. Its main primal function has usually been to maintain a safe and secure community through implementing various community activities, including both disaster reduction and crime prevention. In fact, right from the very beginning in the 1970s when Jishubo was being

initiated by the local governments, many Jishubos have assumed Chonaikai as a parent body.

Jishubo is a social scheme widely used by various levels of government bodies to mobilize citizens to participate in disaster workshops and other activities. Jishubo was originally planned as an association with the specific purpose of autonomous disaster management, but the Kobe earthquake has changed its first priority into a systematic expansion and prevalence of the organization. As a result, local governments started to ask for communities' cooperation on the formation of new Jishubo through the effective conduit of Chonaikai. This strategy has proved to be effective since as mentioned above, Chonaikai has long served as an institution to transmit and implement policy awareness and dissemination among residents. However, a case study in Kishiwada City-Osaka[9], shows the disadvantage is that most of the participants in Jishubo are elderly people who may be participating in Jishubo for reasons not entirely related to disaster preparation/ mitigation and thus do not truly want to participate in the social scheme of Jishubo.

Other schemes of community based disaster preparedness are conducted by the university or private sector, such as the disaster responsive automatic vending machine, as developed by Research Center for Disaster Mitigation of Urban Cultural Heritage (D-MUCH)-Ritsumeikan University. On peace time, Disaster-Responsive Automatic Vending Machine has 3 functions: (1) electric bulletin board shows the latest news; (2) poster drawn by students, which theme is disaster mitigation; and (3) map for evacuation site. During emergency, this vending machine has 2 more functions: (1) serve drinks free for victims of disaster; and (2) disseminate information of disaster in Japanese and foreign



languages about the evacuation route and the latest information.



Figure 3. Canned Emergency Supplies-i Bousai

The second one is Canned Emergency supplies “iBOUSAI”, Emergency supplies for Stress Care, which is developed after Disaster-Responsive Automatic Vending Machine.



Figure 4. Four Types of iBousai

The iBousai have 4 types for 4 different targeted people, as shown in Figure 4.



Figure 5. The Emergency Medical Information Kit for Elderly

Third, Emergency Medical Information Kit for elderly people, which consists of 6 sheets: (1) medical information sheet; (2) copy of a health insurance card; (3) copy of the clinic ID card; (4) paper explaining the medicine; (5) medicine for emergency; and (6) paper for calling emergency. The fourth one is map making, which is developed through 3 steps: (a) confirm dangerous area, evacuation area and routes for residents; (b) confirm where fire extinguishers and fire buckets are; and (c) confirm what should be prepared for evacuation.

## 2.2. Discussion on Indonesia

As the commitment to the implementation of Hyogo Framework Action Plan for Disaster Risk Reduction 2005-2015, government of Indonesia has developed disaster management related policies, instruments, and institutions, such as:

1. Law Number 24 Year 2007 on Disaster Management;
2. National Disaster Management Plan 2010-2014, which encourage gender mainstreaming into disaster management and risk reduction programs, through specific programs for women and children; the poor, minority and marginalized groups, as well as the disables and those with special needs;
3. Community organizations that implement disaster management initiatives, such as (at the national level) the Consortium for Disaster Education (CDE), the National Platform for DRR (Platform Nasional PRB), and similar other disaster risk reduction forums;
4. Regular disaster simulation, development of community-based early warning system and disaster prepared groups; etc.

However, there are still some problems occurred in their implementation, such as:

1. In the implementation, it is not well disseminated to the community, especially for women and elderly.
2. The institutional orientation of disaster management in Indonesia still tends to emphasize more emergency response rather than disaster prevention and risk reduction.
3. The role of local disaster preparedness teams has not been significant in recent disasters.
4. Low utilization of science and technology in reducing disaster risks, including the utilization of technology-based early warning systems.

The issue of gender and marginalized group, including the poor, whose plight is often neglected in time of disaster. Since the disaster awareness can only be maintained by routine trainings and campaign, evacuation drills, and other related activities, there is an urgent need for involving all of the related stakeholders in the implementation of disaster management—especially the community based organizations, as well as strengthening the coordination among them. The other option will be integrating the awareness of disaster risk reduction in the regular meetings of existing religious/ social/ economic communities/ organizations/ forums in Indonesia (which most members are female) such as majelis taklim, PKK, posyandu, micro-credit beneficiary groups, foster house, etc., since disaster risk reduction is a cross-cutting issues and should be integrated in all development aspects.

In terms of education, the integration of disaster risk reduction in the formal school curricula is a must. Despite of that, integrating this matter into the non-formal literacy education (Paket A-equivalent to elementary school, B-

equivalent to junior high school, and C-equivalent to high school) is also important to reach the women outside the formal schools.

Taking Japan experience into consideration, the awareness for the family, especially the female headed households and the elderly who lives alone (who are mostly founded near Merapi) is also very important. This is due to the rare opportunities for the female headed households to participate in this kind of awareness/ campaign, compared to male headed households. Therefore, special disaster preparedness kits and visits should be designed for them, in collaboration with the local communities, such as “Smong.” It is a part of the Simeulue indigenous culture, transmitted through songs, short poems, lullabies, and stories, which describes the occurrence of giant waves after a major earthquake. It was effectively increased the tsunami preparedness of Simeulue people, which have resulted in only seven casualties, out of more than 86,000 inhabitants in Simeulue during tsunami 2004 [13].

Last but not least, the role of local government also should be strengthened in developing accurate database on disaster prone areas and early warning system should be developed and communicated to the communities regularly. Developing preparedness material with local context (including local/ national language) are very important, since it will also help in getting support from all stakeholders, the community, local government, as well as from parliamentarian [13].

Moreover, the accurate database before and post disaster also should be developed, since this will be needed in time of rehabilitations and reconstruction, as well as during the emergency and the damage/ loss calculation after the disaster occurred. The accurate database will

help the accurate provision of emergency response, based on the needs of the survivors, which is different for male and female, as well as for children and elderly, and the marginalized groups with special needs[13].

### III. Conclusions

The conclusion of this study are as follows:

1. In Japan, community based organization is more effective than founded by local government, and implementing all of the policies is very imminent, including the age, gender and marginalized group issues.
2. In case of Indonesia, strengthening all stakeholders coordination is very important, especially the community based organizations. Besides of that, emphasizing Disaster Risk Reductions (DRR) preparedness with local wisdom, gender & marginalised group issues is also imminent.

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