

Community and Tsunami Disaster

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Abstract. The 2004 tsunami has caused tremendous damage in history to many coastal countries around the Indian Ocean with more than 200,000 peoples were deaths. The frequency and severity of natural hazards and disasters such as tsunami have increased in recent years and those trends are expected to continue well in the future. The preparation for tsunami must include research, education, community empowerment and relevant action and practices. Many reports confirmed that a major underlying factor to any catastrophe was people's general lack of awareness about disaster risks and how to respond appropriately in order to minimize the loss of lives, property and livelihoods. Therefore, the objective of this paper is to highlight community roles in order to strengthen their resilience to cope with tsunami disaster. This paper involved with secondary data which are collected from journal, proceedings, books and internet. From the study, although a tsunami cannot be prevented, the impact of a tsunami can be mitigated through community preparedness, timely warnings, and effective response. With better technology, planning and education, preparing for disasters such as tsunamis can be improved. However, to assure all programmes and strategies which cope with tsunami hazard successfully, community as a main stakeholder must be involved because any system will fail if the community as public is unaware and unprepared on what actions to take in the event of a tsunami. Moreover, communities can survive future tsunamis if they are well prepared and have integrated knowledge about this matter. Overall, to make sure the successful of all programmes and strategies which cope with tsunami hazard it must involve community as a main stakeholder.

Keywords: Tsunami disaster, tremendous damage, community roles, programmes and strategies

1. Introduction

The frequency and severity of natural hazards and disasters such as tsunami have increased in recent years and those trends are expected to continue well in the future. The earliest recorded disaster was the tsunami associated with the 684 C.E. The destruction of much of Alexandria on August 21, 365 C.E. as well is presently attributed to a tsunami. Generally, tsunamis occur most frequently in the Pacific Ocean, but are a global phenomenon. Japan is the nation with the most recorded tsunami in the world. The number of tsunami in Japan totals 195 over a 1,313 year period, averaging one event every 6.7 years, the highest rate of occurrence in the world (<http://www.newworldencyclopedia.org/entry/Tsunami>).

For example, On March 11, 2011 a Moment Magnitude 9.0 earthquake struck off the northern Coast of Japan and generated a tsunami that rose up to 135 feet above sea level and killed over 20,000 people.

A tsunami is a very long-wavelength wave of water that is generated by sudden displacement of the seafloor or disruption of any body of standing water (<http://www.tulane.edu/~sanelson/geol204/tsunami.htm>). Earthquakes, mass movements above or below water, volcanic eruptions and other underwater explosions,

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landslides, large meteorite impacts and nuclear weapons testing at sea all have the potential to generate a tsunami. A tsunami can have a range of effects, from unnoticeable to devastating. It has been reported that severe damage has been inflicted on ecosystems such as mangroves, coral reefs, forests, coastal wetlands, vegetation, sand dunes and rock formations, animal and plant biodiversity and groundwater. In addition, tsunami can cause devastating economic harm that is difficult to recover from and also can take communities decades to recover from major tsunami damage. For examples, in Malaysia, estimated cost of properties destroyed by the 2004 tsunami is about RM100 millions (Tajul 2005) and for Banda Aceh, Indonesia, estimation of total damage exceeded US\$4.45 billion (approximately 97% of Aceh's GDP) (BAPPENAS and the International Donor Agency 2005). It is because, when a tsunami wave reaches a shoreline, it will arrive either as a rapidly rising water surface or as a strong turbulent bore and causing serious damage to coastal structures, human properties and the natural environment.

2. Objective

The objective of this paper is to highlight community roles in order to strengthen their resilience to cope with tsunami disaster.

3. Methodology

This paper involved with secondary data which are collected from journal, proceedings, books and internet which community are participated or involved in order to cope with tsunami disaster.

4. Analysis and Findings

4.1. Community and Tsunami Disaster

Tsunami can strike at any time without warning. For that reason, there is a need for urgent action at all levels to adapt to the impacts of tsunami that threaten community especially coastal communities. Moreover, to reduce the impacts, adaptation strategies and self-reliant activities are required to build community resilience.

No effective tsunami mitigation programme can be undertaken without an understanding of the coastal impacts of tsunami. This natural disaster cannot be prevented but the resulted damages and effects can be reduced through proper planning. As quick action, the United Nations Environment Programme (UNEP) almost immediately convened a meeting (Cairo Conference 2005) and put out 12 guiding principles for post-tsunami rehabilitation and reconstruction. The overarching principle was on reducing the vulnerability of coastal communities to natural hazards by focusing on a regional early warning system and various measures to be taken. The preparation for tsunami must include research, education, community empowerment and relevant action and practices. With better technology, planning and education, preparing for disasters such as tsunamis can be improved. However, all the strategies especially build hard structures such as seawalls and breakwaters include high cost of construction and maintenance, modification of the existing environment and inconvenience in optimally utilizing the coastal area for development (Harada and Imamura 2005). Therefore, to make sure the successful of all programmes and strategies which cope with tsunami hazard it must involve community as a main stakeholder. As examples, The Citizen Corps in United States is an organization of volunteer service programs, administered locally and coordinated nationally which seek to mitigate disaster and prepare the population for emergency response such as tsunami through public education, training, and outreach. Otherwise in India, National Disaster Management Authority has been a shift in emphasis from a government-centered approach to decentralized community participation

Many reports confirmed that a major underlying factor to any catastrophe was people's general lack of awareness about disaster risks and how to respond appropriately in order to minimize the loss of lives, property and livelihoods (Takako 2011). Therefore, community needs to know the basics of what tsunami is, how it is caused and how it can devastate them. Any system will fail if the public is unaware and unprepared on what actions to take in the event of a tsunami. For that reason, Adger et al. (2005) for example, highlighted the importance in the linkages between ecosystems and human societies and moved the concept to a more realistic viewpoint aimed at sustaining and enhancing the capacity of social-ecological systems to

adapt to uncertainty. However, community preparedness is one of the most difficult tasks especially in certain areas where tsunami occurrences are rare and the communities at risk may not be able to instil the safety procedures from generation to generation.

Besides that, ways have to be found to ensure that a community is strengthened, becoming less fragile and less susceptible to disaster as well as tsunami impact. It is important for the community members to know what the disasters are and to prepare themselves for extreme disasters such as tsunami mentally and physically. Therefore, formal and informal education is apart of tsunami disaster awareness and preparedness because it is the least expensive and most effective way for disaster mitigation; even without sophisticated and expensive technologies for warning, people can escape and mitigate the natural disasters safely and sustainably if they know the tsunami safety methodology. Furthermore, early learning is better than preparedness, because preparedness needs time and efforts as well as expenditure. The important thing is, community must have commitment and willingness to learn (Absornsuda 2011). With enough education, community can survive in future tsunamis if they are well prepared.

However, the most important and challenging part of preparing the community for tsunamis is organizing activities that people will listen to and learn from, despite the many other priorities of their daily lives. Convincing people to take steps to prepare for tsunami also takes time. Furthermore, as the time passes, people tend to forget the consequences of the previous tsunami (Absornsuda 2011). So, it is necessary to continue educating public so that they are better prepared and able to respond correctly in relevant disaster such as tsunami and response agencies regarding their roles and responsibilities during an emergency. It is therefore important to convince the people that the loss due to tsunami can be significantly reduced if the environment resilience is protected and if the threats are prepared for well.

4.2. Community and Tsunami Disaster in Malaysia

The major countries hit by tsunami 2004 are Sri Lanka, Indonesia, Maldives, Thailand and Malaysia. It is the fourth-largest earthquake since such measurements began in 1899, tying with a 1952 quake in Kamchatka, Russia. Although Indian Ocean tsunami hit Malaysia less hard than it did neighboring countries, the disaster did kill 69 people in the country and left 8,700 homeless, and inflicted millions of dollars of damage on coastal communities. Economic activities such as farming and fish processing were brought to a halt as affected villages struggled to get back on their feet.

From history records, Malaysia was not overwhelmed by the scale of the disaster but it was the worst-ever natural disaster for Malaysia. Tsunami on Dec. 26, hit several states including Perlis, Penang and Kedah on Malaysian west coast. Kampung Sungai Muda, in the state of Kedah for example, was one of the worst affected villages. Twelve people died there.

In Malaysia, to cope with tsunami disaster, community conversion is one of the approaches in order to help community to identify problems and jointly come up with solutions. The practice is rooted in the recognition that communities have capacities to care and change, and that relationships are the centre of society. Community ownership of their problems makes solutions sustainable where to focus the community's dialogue on its tsunami experiences, and facilitate a process whereby community members identify the issues they have faced and the solutions they have found. Through the group discussions, community's needs, problems and other issues relating to the tsunami should be scanned and in long term can strengthen those communities with skills and knowledge how to cope with natural and man-made disasters such as tsunami.

5. Recommendations and Conclusion

Community knowledge, preparation and awareness are the keys to making a real difference in the fight against tsunami hazard. Therefore, after the Indian Ocean Tsunami, many awareness-raising activities and campaigns have been initiated at national and community level for disaster preparedness. This includes not only the development of educational materials and publications, but also community drills and the placement of warning signs and evacuation routes. Thus, community capacity should be increased in order to increase the preparedness of the residents to face future tsunami hazards.

Tsunami awareness is important because it helps people who could potentially be impacted by tsunami to prepare themselves. In an effort to increase public awareness for tsunami it is essential that communication strategies be used that are capable of drawing out personal behaviour change.

Communities can survive future tsunamis if they are well prepared and have integrated knowledge about this matter. Apart from that, education is considered as one of the key tools for any subjects. The real mainstreaming to risk reduction starts from formal education institutions to informal education. The mode and method of education should be one of the important issues to make positive impacts. Therefore, multidisciplinary approach with combination of theory and practice are very important.

According to Takako Izumi (2011), societies could anticipate and reduce disaster impacts by adopting many approaches such as:

5.1. Using traditional experience and knowledge (coping mechanism)

There is common knowledge in the Simeulue Island in Indonesia that people must run to higher lands when they feel tremors. The act of moving to relatively higher and safer area was not merely a spontaneous act, but was related to a tsunami occurrence of the past, that had been repeatedly handed down from one generation to another. This common knowledge was known as ‘smong stories’ or stories about the tsunami incident in 1907. Due to this knowledge, the number of victims that dies after the Indian Ocean Tsunamis in December 2004 was relatively smaller.

5.2. Developing capacity of children and students

Incorporating hazard and disaster risk-related issues into existing education curricula contributes to continuous learning and enhancement knowledge. By educating children, the knowledge will be transmitted to future generations. They are effective agents for improving safety and resilience. Higher education and research also merit special attention, as they are the sources of practical means to build disaster reduction capacities. In addition, formal education can help children in translating the experience of a large disaster and assist them to respond appropriately in future hazard even.

There is a famous story on a girl named Tilly Smith who saved nearly 100 foreign tourists at Maikhao Beach in Thailand by raising the alarm minutes before the arrival of the tsunami caused by the 2004 Ocean earthquake. She learned about tsunamis in a geography lesson two weeks before the tsunami from her teacher. Therefore, a basic education on the different types of natural hazards is crucial.

Overall, community roles are very important because all the sophisticated technology won't matter if we don't reach real communities and people. For example, satellites, buoys, data networks will make us safer, but we must invest in the training, the institution-building and awareness on the ground. Therefore, people must understand how to prepare and respond to a disaster, as well as how to deal with the aftermath. In order to manage the variety of situations, communities need to be trained and familiarized with Emergency Preparedness and Planning practices so that they are better equipped to cope with an emergency situation arising from a disaster.

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