

## The Importance of Preserving Tacit Knowledge for Natural Disaster Casualties Anticipation

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**Abstract:** Tacit knowledge is transferred from one generation to another generation in many ways. This tacit knowledge is worthy to be preserved due to its valuable benefit for the sake of mankind. This study attempts to examine the ways people transferred tacit knowledge in two nearby places and its effect related to the disaster which struck them both. The fact is that both places indicate different condition after disaster due to the different way they manage their tacit knowledge. Data collected for this qualitative study derived from news articles concerning the tragic natural disaster and its effects. The results is that one of the ways they transferred tacit knowledge is more effective than the other indicated by the number of victims caused by the same natural disaster which hit them at the same time and manner. Preserving this tacit knowledge is important for mitigation in the future due to the high level of natural disaster risk.

**Key words:** Tacit knowledge, disaster, condition, time, mitigation

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### INTRODUCTION

On a fresh Sunday morning, 26 December 2004, all of a sudden the earth shook hard. People bursted out of their houses for safety should their houses collapsed and buried them alive. The magnitude of the earthquake was later measured at around 9 on the Richter scale with the epicentre off the west coast of Sumatra. Not so long afterwards, giant waves followed the earthquake wiping out the beach.

It is reported that the highest waves could reach higher than a coconut tree like a dark wall with rumbling sound as it went nearer to the beach such an enormous power that it even dragged a 2.600-ton power plant ship to inland. Such countries as Malaysia, Thailand, Myanmar, Bangladesh, India, Sri Lanka, Maldives, Madagascar, Somalia were affected by the giant waves and Indonesia was the hardest hit among all, particularly.

It was the greatest natural disaster ever recorded at the beginning of the 21st century with a great number of casualties and missing people as well as billions of dollars of material damage and loss in total. It claimed hundreds of thousands of lives, swept buildings, cattles, vegetations, vehicles, separated families, displaced thousands of homes, flooded the towns some kilometres away from the shore, leaving corpses and a huge pile of debris all over town for days.

Surprisingly, such great number of victims is not found in a small island off the west coast of Sumatra. According to news reported by BBC (Anwar, 2016), the tsunami claimed only seven people of the total inhabitants such a contrast fact compared to the death toll in the mainland of Sumatra. It is in the island of Simeulue that such a miraculous blessing happened. This study is going to examine the reason behind the small amount of victims in Simeulue and compare it to the condition in the mainland Aceh.

### Literature review

**Knowledge:** Knowledge is what people believe based on meaningful and organized accumulation of information it can be combined with other information, interpreted and acted upon (Desouza and Paquette, 2011). Knowledge can be divided in two dimensions (Averweg, 2010; Panahi *et al.*, 2012).

**Explicit knowledge:** knowledge which is articulated, written down, codified and communicated in symbolic form and/or natural language

**Tacit knowledge:** knowledge that people usually acquire individually or as a group which comprises both cognitive and technical elements.

**Indigenous knowledge:** Indigenous knowledge is an example of tacit knowledge. It is commonly found in practices by tribes in remote places around the world in the form of sacred rites, dances, chants, lullabies, folklores, etc., UNESCO defines it as a complete body of knowledge, know-how and practices maintained and developed by peoples, generally in rural areas who have extended histories of interaction with the natural environment. These sets of understandings, interpretations and meanings are part of a cultural complex that encompasses language, naming and classification systems, practices for using resources, ritual, spirituality and worldview (Stevens, 2008). Indigenous knowledge itself has such features as Anwar (2016):

- Local, holistic and integrative
- Functional
- Experiential rather than theoretical
- Learned through repetition
- Constantly changing
- Socially distributed
- Fragmented distribution
- Tacit
- Transmitted orally

**Knowledge management and transfer method:** Knowledge management process is important in preserving tacit knowledge. There are four different modes of knowledge conversion.

**Socialization:** Conversion of tacit knowledge to tacit knowledge consists of sharing knowledge in face-to-face interaction, imitation and practice. By sharing experience, observation, apprenticeship or mentoring individuals learn and gain a sense of competence.

**Externalization:** It is the conversion process that gives a visible form to tacit knowledge. In this mode, individuals are able to articulate the knowledge (know-how, know-why, care-why). Tacit knowledge can then be written down, recorded, drawn or made tangible or concrete in some manner.

**Combination:** This conversion of explicit knowledge to explicit knowledge recombines discrete pieces of explicit knowledge into a new form, such as synthesis in the form of review report, trend analysis and brief executive summary.

**Internalization:** Conversion of explicit knowledge to tacit knowledge which occurs through the diffusion and

embedding of newly acquired behaviour and newly understood or revised models. This process integrates shared or individual knowledge into individual mental modes.

## MATERIALS AND METHODS

This study is using qualitative approach with literature review method. Data collected for this study derived from news articles concerning Indian Ocean earthquake and tsunami and manuscripts about earthquake in Sumatra either from online or printed news. The study are then observed to analyze the relation between disaster effects, the reason behind it and the anticipation of possible disaster effect in the future.

**Fact in simelue:** The inhabitants of the offshore island were later interviewed by mass media about the tsunami effect and they described that it was the folklore that saved their lives during the lethal catastrophe. They knew the stories about earthquake and tsunami from their parents and their parents before them. It was transferred from one generation to another generation by word of mouth. The elders in the island were all brought up with stories and lullabies about tsunami and that made them very well prepared if tsunami should happen anytime at all. They recalled last tsunami which happened about a century ago from their parent's stories and it was their parents who taught them how to react against earthquake and tsunami.

It is understood that the inhabitants of Simeulue are well accustomed to this type of disaster because they already have a particular term for what we all know today as 'tsunami'. It is 'semong' or 'smong' in their mother tongue. The term 'smong' or 'semong' indicates that tsunami is not something new for them because earthquake did happen there and tsunami struck once in a while. Even their children today have been very well understood what to do if earthquake should happen. They are told to wait for a few minutes to see whether or not there are signs of tsunami. The key is to see if the sea started to recede then they have to run for their lives to the hills or other higher terrain because soon after the sea receded, giant waves were about to sweep the shore.

On the day after the earthquake struck, some people acknowledged that the sea started to recede and immediately they shouted "smong" to warn others to run to the hills for safety. They did not care to catch plenty fish available in the beach because they have understood what sort of disaster was about to happen soon. This knowledge is proven to be advantageous to save their

lives, moreover the geography in the island helped them to escape from tsunami due to the many hills available not far from home.

**Fact in aceh:** Soon after the earthquake the sea started to recede and many people gathered in the beach to catch stranded fish. Some of them just watched the others catching fish and the strange occurrence of receding sea without realizing what was about to happen soon (). They were not well equipped with tacit knowledge (Kompas, 2012) as the inhabitants in Simeulue. Although, Acehese recognized a term “ie beuna” or great flood from the sea, it is no longer in use today. This ignorance is later proven to be fatal for people in the mainland because they did not have enough time to run for safety anymore.

## RESULTS AND DISCUSSION

**Manuscript concerning earthquake:** Few years later after the 2004 tsunami in Aceh, it is found that there are several manuscripts containing information about earthquake and tsunami. The manuscripts were found in several places as in a library in Banda Aceh, Aceh State Museum, some places in West Sumatra, National Library in Jakarta and in the Netherlands. At least there are fifteen manuscripts concerning earthquake found, meaning that earthquake and tsunami often happen in Aceh and have been very well recorded.

One account in Arabic language contained in a 19th century manuscript explicitly mentioned that massive earthquake struck twice in the morning. A manuscript titled “Takbir Gempa” in Ali Hasjmy library and written around 18th century described the event following earthquake within a day from dawn until midnight in twelve months. In one part there is an account saying that if earthquake struck in dawn, everyone would be in trouble. If earthquake struck in the morning, great waves would sweep the land. Another manuscript titled “Naskah Gempa dan Gerhana Wa-Shahibul” in a book titled “Ibrahim Lambunot” mentioned about “smong”, a Simeulue word for tsunami which happened around the early of 20th century.

Another study from newspaper mentioned an account of earthquake is found in a surau, an Islamic worshipping place, in Pariaman and Tanah Datar, West Sumatra. The content is similar to those found in Aceh. Meanwhile, there are three manuscripts about earthquake found in National Library of Indonesia and some other manuscripts concerning account of dreams, eclipses, earthquake found in The Delf Collection and in Collections Cornets de Groot and Rijks-Instelling, Leiden, the Netherlands.

**Why manuscript and storytelling:** The ancestors have realized the importance of knowledge on earthquake and tsunami for the sake of humanity and the next generations because these disasters had happened during their life time and could happen again later. They have seen and experienced enough the disasters themselves and how destructive they were. Through their experience with tsunami they learned that this disaster can be anticipated through careful observation of the nature’s phenomena.

Such disaster as earthquake cannot be predicted but tsunami can be detected if only one understood the nature’s signs. The ancestors in the past are very well equipped with knowledge in understanding the nature’s signs as they were fully dependent on the nature to fulfill their daily needs so they had to adjust themselves accordingly to the nature’s wish. From an interview by a foreign newspaper, a head of district council in Simeulue said that tsunami is nature’s bath water and earthquake is nature’s see-saws which they must respect but not fear.

The main reason the ancestors wrote it down on manuscripts is that they want to convey messages, knowledge, advice and direction to the next generations as to what to do if earthquake and tsunami happened. They chose to write it down so that at a particular time later in the future, their descendants could read it and benefit from it.

Unfortunately, the well recorded knowledge as contained in those manuscripts cannot be utilized because no one ever noticed the existence of them and they remain concealed for centuries. Only after the tragic disaster took place, people began to seek information and those manuscripts existence came into being and people become aware of them. It is partly due to difficulties in reading manuscripts. It takes more time to read and understand the information contained in them as they are mostly written in alphabets and language style we no longer use.

As for the case in Simeulue, the inhabitants of the island did not record their ancestor’s tacit knowledge in manuscripts but they are very well equipped with the knowledge by word of mouth. Highly tacit knowledge may only be transferable through the development of routines (Ranucci and Souder, 2015) in this case tacit knowledge is transferred continuously from generation to generation without any obstacles as the elders always actively remind their offspring through folklores and lullabies in daily activities. Therefore, the casualties from this disaster could well be minimized because the inhabitants are accustomed to such stories from the past. However, disseminating tacit knowledge through socialization as this one is not without threat. People may forget to

forward or find it difficult to share what they have known or may tend to underestimate the importance of such knowledge because of the highly personal nature of tacit knowledge (Panahi *et al.*, 2013).

### **CONCLUSION**

There are many ways to convey information from one individual to another. If the two of them are apart by time and space as ancestors and their descendants, it takes more than just one method to convey information created in the past. Ancestors have got the data and then combined them into information which in turn developed into knowledge. It is the knowledge derived from direct experience that makes it worthy of preservation. In this case, there are two methods used in transferring tacit knowledge by socialization and externalization. Both methods have their own advantages and disadvantages. However, only one method used in preserving tacit knowledge is effective in minimizing the casualties.

### **RECOMMENDATIONS**

Preservation enables the next generation to learn about the past and make sense of it. Death toll in both places indicated that tacit knowledge from ancestors are better preserved and disseminated through folklores and lullabies than through manuscripts.

However, this tacit knowledge in Simeulue is necessary to be recorded in written form and other documentation such as audiovisual material. Manuscripts in Aceh play important roles as well if we make a good use of them and do not only keep them in libraries or museums. The knowledge contained in those manuscripts needs to be transliterated, translated into the language commonly used today, published and disseminated through education and information institutions.

It is recommended that both methods, socialization and externalization should complement and not replacing each other in transferring tacit knowledge because each method has its own advantages if applied in different environment and situation. As any other knowledge, it takes theory in written form and practice all at the same time to make tacit knowledge beneficial for the sake of mankind.

### **ACKNOWLEDGEMENTS**

This research is supported by Faculty of Humanities, Universitas Indonesia, the Directorate of Research and Community Services, Universitas Indonesia and National Library of Indonesia.

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