The Value of Local Wisdom *Smong* in Tsunami Disaster Mitigation in Simeulue Regency, Aceh Province

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Abstract. When tsunami occurred in 26th December 2004, the number of people who died in Aceh Province land were 300.000 people whereas in Simeulue only 7 people who died. It is supposed that there is local wisdom in Simeulue community. The study is aimed to reveal the form of local wisdom *smong* in Simeulue community. The verification qualitative approach is used to test the ability descriptively. Data collection technique used in-depth interview, participatory observation, documentary study and literature study. Data analysis technique used Delphi method. The result of study showed that the local wisdom *smong* is tsunami early warning system which is implemented by Simeulue community through manafi-nafi (folkfore), mananga-nanga (cradlesong to lull a baby to sleep), and nandong (humming). Besides, morphology and the land use very support the mitigation toward tsunami. The people who live behind the hill are protected by lush vegetation as tsunami breakwater. The local wisdom *smong* is socialized through appeal information boards and songs included in UKM products which much consumed by community. All these ways become effective in increasing the community's knowledge of tsunami disaster mitigation. The government consistency to socialize *smong* need to be intensified to young generation in order that the local wisdom *smong* is not disappeared in Simeulue community.

1. Introduction

Earthquake and tsunami on 26th December 2004 in Aceh province did not just cause destruction in infrastructure only, the ruined houses and buildings due to the earthquake and tsunami reached 1,3 million units [1], and inflicted a very huge amount of fatalities, with the overall reached 300.000 people [2-4]. By the time when all Acehnese people in grief, there was one regency in the coast of the west part of Aceh province that formed archipelago zone, that was Simeulue regency. This regency got very severe impact when tsunami took place 13 years ago, all buildings, offices, and worship places and also other facilities and infrastructures that were located in the coast became severely damaged, and the amount of the damaged buildings was 13.022 units [5]. However, that condition was inversely proportional with the fatalities in Simeulue where in there was only 7 people who died from the total number of people who lived in Simeulue in 2004, that was 71.517 people [5]. The little amount of fatalities was caused by local wisdom in Simeulue society, which is known by *smong* local wisdom.

Values constitute abstract things, values are abstract concepts [6], and exist in all elements of human life, either they are positive (good) or negative (bad) in societies, "making the society pushed

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along with the obligation for the society to vivify and practice the ideal-considered values" [7, 8]. Subsequently, values are also deemed to be able to overcome any propositions that occur in societies, along with the great benefit in human life, "values answer basic existential questions and helping to provide meaning in people's lives" [9]. Values as concepts or beliefs about the expected behavior or conditions, can overcome particular situation, being a guide in deciding, evaluating attitudes and events" [10, 11] Behaviors or acts that exist in values there are either spontaneously-natured or that need a long time to take decisions. [11]". Before that action is conducted it is also can be ruminated quickly until be called spontaneous, there also that needs a very deep consideration." So that it really makes sense in the daily, there are people who will easily believe and people who need long time to believe in a value, value that usually exists in local wisdom that applies in a particular group of society. Local wisdom constitutes local notions that are expedient-natured, full of discretion, has good value that has been embedded and followed by its society members [12]. Then, local wisdom as discretion or knowledge that delivers behavior as the result of their adaptation effort towards environment [13-16]. Local wisdom can be understood as notion that contents value and applies in a particular region, and also has wise characteristic, full of discretion, that has been embedded well in the local society.

Local wisdom usually comes from their forebear in the past, that is followed by its society members from generation to generation. What all the ancient thinkers seemed to realize is that without wisdom, ways of knowing are constrained by a tragic paradox: the clearer the view they provide, the more limited the slice of reality they reveal. The integrated thought of 'primitive' men and women, who did not distinguish between religion, art, science, habits, and instincts, slowly gave way to more and more specified "domains" of knowledge [17-20]. So that the truth of a local wisdom has been believed well and actuated by every society, as cultural inheritance from the past generation. Similarly to the *smong* local wisdom that has been proven able to save 71.517 people when tsunami struck Simeulue on 26th December 2004. Quoad the objective of this research is to acquaint how the local wisdom of *smong* in mitigation of tsunami disaster that ever came to pass in Simeulue regency, Aceh province.

2. Methods

The research method is qualitative verification that will be explained in description form, and also it denotes an effort inductive approach towards the entire research processes that are undertaken. The research location was in Simeulue regency, Aceh province, and the subjects of this research were customary chairman, high officials of MAA (Customary Assembly of Aceh), government, government institutes, head of BPBD of Simeulue regency, and the people. The technique of data collection uses in-depth interview, parcipatory observation, documentation study, and literature study. The technique of data analysis uses Delphi method.

3. Results and Discussion

Quoad the outcome in this research is the local wisdom of *Smong* that constitutes a speech culture or oral tradition that exists in Simeulue society, that has existed since one century ago that is passed from generation to generation, from one generation to the next generation. The *Smong* local wisdom has a very close relation Tsunami Early Warning System, but in traditional way. *Smong* turns out to be the sacred word that is preserved well by society in Simeulue, the word *smong* must not be pronounced casually in the daily in Simeulue. Because in Simeulue society, *smong* means the wavy tide of sea water that rolls in and has height above normal of sea wave in general. Followed by the high seed of the water and big booming sound which comes from within the sea, subsequently strikes the entire of people's settlement, where before preceded by the occurrence of linon that has great strength. There are some signs before the coming of *smong*, they are: the receding sea water tens of miles from the coast along with a very big noise sound. Simeulue people know the local wisdom of *smong* through poetries in *manafi-nafi* (folklore), *mananga-nanga* (child lullaby), *nandong* (humming) that are introduced to progeny since from the cradle till the old age. *Quoad* the poetry is:

This is a saga from Simeulue Island, conveying the messages of *smong* according to past experience in the year of 1907. This story is said to be from our ancestors, if the earthquake is vehement, the sea water recedes and heard from the sea a rumbling sound, and livestock and pets perturbed. It means water will come up or *smong* is its name, so be ready to forage high places in order we can be saved.

Poetry of *Smong*
In Devayan language

"Enggel mon sao surito (please hear a story), *Inang maso semonan* (once upon a time), *Manoknop sao fano* (a village drowned), *Uwillah da sesewan* (it is told like that), *Unen ne alek linon* (earthquake that started), *Fesang bakat ne mali* (followed by giant wave), *Manoknop sao hampong* (drowned the whole regions), *Tibo-tibo maawi* (suddenly). *Anga linon ne mali* (if the earthquake is vehement), *Oek suruik sauli* (followed by receding water), *Maheya mihawali* (be soon to look for places), *Fano me singa aktaek* (a highland in order to be saved), *Ede smong kahan ne* (*smong* is its name), *Turiang da nenek ta* (the history of our ancestors), *Mi redem teher ere* (please remember this all). *Pesan navi-navi da* (the message and advice), *Smong dumek-dumek mo* (Tsunami is your taking bath water), *Linon uak-uwak mo* (earthquake is your craddle), *Kilek sulu-sulu mo* (lightning are your lamps), *Eklaik kedang-kedang mo* (thunders are your drums)".

According to the poetry above, can be known clearly various signs that occur before tsunami, when tsunami happens, and how the steps that must be done by people in order can be saved from tsunami as part of mitigation of tsunami disaster. The poetry above is passed by people from generation to generation, that makes the knowledge of Simeulue people about tsunami disaster mitigation is very well, and it was proven when tsunami on the past of 26th December 2006, some times after earthquake happened, the people had been started to be aware, so that when the tsunami happened like the signs that have been told by their ancestors they can know what actions they must do to save themselves when tsunami happens. And the result is so many of Simeulue people were saved from tsunami wave that had successfully destroyed Simeulue regency. Simeulue people started to know *smong* has similar meaning to tsunami in 2004, before that they just recognize *smong* term, never recognize tsunami term.

There are a lot of Simeulue people were saved from tsunami disaster not merely due to the local wisdom *smong* only, but also influenced by morphological situation and land usage that is so supportive in order to be easily able doing the tsunami disaster mitigation. It is caused by the existence of mountain or hill that are so close to people's settlement, the distance is only about 100 meter up to 300 meter from people's residence that exist and are spread in the entire of Simeulue regency. The overall, Simeulue regency has morphological form that can be classified into 3 (three) kinds, they are: first, consists of coast, paddy fields, mountains, and hills. Second, consists of coast, people's settlement, paddy fields, and also mountains and hills. Third, consists of coast, settlement, mountains and hills, the paddy fields, and ended with mountains and hills. Beside influenced by hills existence that is close to people's houses, the existence of vegetation formation around the coast that functions as fence or fortress, and also has vital role because it functions as wave breaker when tsunami happens.

Next, it will be discussed about the meaning of poetry that exists in *smong* local wisdom in Simeulue people, Inang maso semonan (once upon a time), tells about *smong* that happened in the past year of 1997 in Simeulue people. Manoknop sao fano (a village was drowned) tells about the drowning of Simeulue islands when *smong* happened on Friday 4 January 1907, as the result of M = 7,8 earthquake occurrence with earthquake center in the western part of Nias island or in the southern part of Simeulue island [21].

Unen ne alek linon (earthquake that started), *Anga linon ne mali* (if the earthquake is vehement), *Oek suruik sauli* (followed by the receding water*), Fesang bakat ne mali* (followed by giant wave),

Manoknop sao hampong (drown whole regions), *Ede smong kahan ne* (its name is *smong*), *smong* or tsunami happened if it is preceded by the occurrence of earthquake that has big strength. Then, followed by the receding water tens of miles long from the coast, followed by the arrival of big wave known as *smong*, huge wave from the sea comes forward to people's residence in the land, that causes the drowning of the entire regions. [22] That is: "In several tsunami cases that ever happened, the cause was earthquake, the rise of water column or the recede of sea bed, and submarine avalanche. In general, tremendous eruption of volcanic mountain in the coast (submarine) can also inflict impulsive power that raises the water column and causes tsunami. In other hand, land movement in super marine and the influence of cosmic collision (like meteor) disturbs water from the upper side, like the momentum of the fall of the ruins of materials into the water. "Wave with height 1-2 meter in the sea but the speed can be more than the speed of airplane." Tsunami wave that struck Aceh had the height of 7-10 meter with the speed of 500-800 km/hour [23]. When the wave reached the shallow watery in the coast, the speed will be decreased but the wave height will up tens of meter, this wave height that inflicts tremendous damage on the coast. And also tsunami can be caused by various things that cause the movement of very big water mass from its equilibrium condition (its balance).

Maheya mihawali (look for place soon), *Fano me singa aktaek* (highland in order to be saved), *Turiang da nenek ta* (our ancestors' history), *Mi redem teher ere* (remember this all), *Pesan navi-navi da* (messages and the advices), if *smong* or tsunami happens in our lives, it is commanded to go to the higher places in order to be saved from *smong* wave or tsunami, that all is message and advice that is conveyed by Simeulue people's ancestors since the past 1907. If viewed from the side of its messages and advices that are conveyed by the ancestors of Simeulue people, all of the messages and advices are the correct steps and resemble so much with tsunami disaster mitigation. [24] Tsunami mitigation activities in the coastal environment are: 1) the understanding of the disaster characters and the damage in the coastal area. 2) The understanding of the risk level of coastal area towards disaster. 3) The understanding of environmental condition, social and culture, and local wisdom. 3) The understanding of mitigation efforts either structural or non structural. 4) The improvement of institutional capacity and law enforcement, 5) Factor that guarantees the continuity. Next, [25] Management in tsunami disaster that can be done that is when earthquake happens and sea water recedes suddenly, so be soon to inform to all people, and be soon to run from the houses following evacuation way that is provided to the higher places, like highlands or high buildings.

Simeulue people have acquainted and understood well, what actions that must be done and also to what places or where that become the destiny, what way can be chosen and can be passed quickly in order to arrive to mountains quickly, and what way that must be avoided because can slower to arrive to the higher places to save themselves when *smong* or tsunami happens. Knowing evacuation way well will assist people in finding safer place when tsunami happens [26]. Then, [27] identified three steps that lead to a safe evacuation after an earthquake and tsunami: collect information and issue an official warning; make a decision to evacuate based on risk perception and past experiences of the people in the area; and choose a proper route and safe destination for the evacuees. Besides that, in Simeulue there has been evacuation way direction guide that are spread in the whole regions of Simeulue regency. Focusing on the last point, one way to provide people with knowledge on safe route and destination is by conducting regular evacuation drills. However, the drill is expensive to be carried out and it is difficult to enable many residents to take part [28]. Society also knows which places that become red zone from tsunami disaster, and which areas that are safe from tsunami.

Practicing regularly and recognizing the evacuation route are very useful when the disaster strikes in order to avoid the panic to happen [29-32]. People of Simeulue did not feel panic when tsunami occurred, because the people has often used the evacuation way to go to the fields or gardens that are used as the places to farm on the hills. Unconsciously, people often conduct various practices on the tsunami evacuation path, and it becomes one of the most important attitudes to prepare for facing tsunami. Another action that is taken in tsunami disaster mitigation that exists in Simeulue that is in the edge of the coast exists many coconut and rumba trees to block the tsunami. This action is in accordance with the opinion from [21, 33] that the tsunami mitigation can be done through several

steps, they are: for tsunami disaster mitigation, it is broadly divided into two categories namely natural and artificial measures. Natural measures include coastal vegetation plantation, preservation and protection of beaches and coral reefs, while the artificial measures include construction of breakwaters, seawall and concept adoption of adaptation by the development of elevated coastal infrastructure. The elevated infrastructures means the arrival tsunami wave will not reach the infrastructure or at least the infrastructure will be strong enough and safe when facing tsunami.

Tsunami disaster mitigation found in simeulue is executed not only through actions but also by the development of a variety of infrastructures needed when and after the tsunami occurs, by making various regulations that benefit the community, in order to survive from the tsunami. After that, by constructing embankments on all over the seashore used as a wave breaker, mangrove reforesting on the shoreline, and other steps that will be beneficial to humans and hence can minimize the number of victims, dead or injured, that happened in simeulue regency in 2004, when there were only 7 people died because of the tsunami. This such situation that is expected to happen at other places in Indonesia when a disaster occurs.

4. Conclusions

The *smong* local wisdom in the simeulue community has already existed since 1907 and has been proven to be able to save tens of thousands of lives from the *smong* or tsunami on December 26, 2004. The *smong* local wisdom has a close relationship with tsunami disaster mitigation traditionally, and has been delivered through the poems contained in manafi-nafi (folklore), mananga-nanga (a lullaby), nandong (humming) which have been introduced to the posterity from the cradle to the old age. The *smong* local wisdom is socialized through information boards placed at coastal areas and also written on the box of Small Medium Enterprises (UKM) products that are widely consumed by the Simeulue community. Finally, the *smong* local wisdom is also supported by morphological conditions, the land usage and vegetation formation found in Simeulue regency, thus making it is possible for the Simeulue community to mitigate tsunami easily and safely.

References

[1] Budiman Subandono, Diposaptono 2007 *Hidup Akrab dengan Gempa dan Tsunami* (Bogor: Buku Ilmiah Populer)
[2] Tejakusuma I G 2005 Analisis Pasca Tsunami Aceh *Jurnal Alami*, Vol **10** No 2 Tahun 2005
[3] Rofi, Abdur D, Shannon R, Courtland 2006 Tsunami mortality and displacement in Aceh province *Indonesia Journal compilation Disasters* 2006, **30**(3): 340−350
[4] Shofiyati, Rizatus D, Dewanti R K, Agus W 2005 Tsunami Effect In Nanggroe Aceh Darussalam And North Sumatra Provinces *Indonesia Asian Journal Of Geoinformatics* Volume **5**, No 2, May 2005 Pp: 1-16
[5] Diakses dari website *BNPB GoId* Pada Hari Selasa, Tanggal 04 Oktober 2016 Pukul 2239
[6] Smith, Peter B, and Shalom Schwartz 1997 Values In JW Berry, M H Segall, and C Kagitcibasi, eds *Handbook of Cross-Cultural Psychology* vol **3** (Boston: Allyn and Bacon)
[7] Sauri, Sofyan, Hufad, and Achmad 2007 *Ilmu dan Aplikasi Pendidikan Bagian 3: Pendidikan Nilai* (Bandung: Impherial Bhakti Utama)
[8] Kamakura, A Wagner Novak, P Thomas P 1992 Value-System Segmentation: Exploring The Meaning Of Lov *Journal Of Consumer Research* Vol **19** June 1992 Pp: 119-132
[9] Grube, Joel W, Daniel M Mayton, and Sandra BallRokeach 1994 Inducing Change in Values, Attitudes, and Behaviors: Belief System Theory and the Method of Value Self-Confrontation *Journal of Social Issues* **50**:153-174
[10] Bilsky W dan Schwartz S H 1994 *Values and Personality* In European Journal of Personality Vol 8/1994 hlm 163-181
[11] Sanusi, Achmad 2015 *Sistem Nilai: Alternatif Wajah-Wajah Pendidikan* (Bandung: Nuansa Cendekia)
[12] Sartini 2004 *Menggali Kearifan Lokal Nusantara: Sebuah Kajian Filsafat Jurnal Filsafat*

Agustus 2004, Jilid 37, Nomor 2 (Yogyakarta: UGM)
[13] Suyami Dkk 2005 *Kearifan Lokal di Lingkungan Masyarakat Nelayan Jepara Jawa Tengah* (Yogyakarta: Kementrian Kebudayaan Direktorat Sejarah dan Nilai Tradisional Proyek Inventarisasi dan Pembinaan Nilai-nilai Budaya)
[14] Keraf S A 2002 *Etika Lingkungan* (Jakarta: Pn Buku Kompas)
[15] Irianto, Agus Maladi 2009 *Mahasiswa dan Kearifan Lokal* Diakses dari http://staffundipacid/sastra/agusmuladi (diakses tanggal 27 September 2016)
[16] Mungmachon, Roikhwanphut 2012 Knowledge And Local Wisdom: Community Treasure *International Journal Of Humanities And Social Science* Vol **2** No 13; July 2012
[17] Csikszentmihalyi, Mihaly Rathunde, Kevin 1995 *The Psychology of Wisdom: an evolutionary interpretation* (Published by the press syndicate of the University of Cambridge)
[18] Nakhorn Thap S 1996 Report of the Study on Patterns of Process in Promoting Teacher and School Participation for Prevention and Solution of Problems Concerning Child Labor in Thailand *Journal of Research on Humanities Information Study Office of the National Education Commission*
[19] Marfai, Aris, Muh 2012 *Pengantar Etika Lingkungan dan Kearifan Lokal* (Yogyakarta: Gadjah Mada University Press)
[20] Koentjaraningrat 2009 *Pengantar Ilmu Antropologi* (Jakarta: Rineka Cipta)
[21] Sanny, Abdullah Teuku 2007 *The Smong Wave From Simeulue, A Wakening and changing, post tsunami strategic development of Regency Of Simeulue* (Simeulue: Pemerintah Kabupaten Simeulue)
[22] Kodoatie, Robert J dan Sjarief Roestam 2010 *Tata Ruang Air* (Yogyakarta: Andi)
[23] Saatcioglu M Dkk 2005 Effects of The December 26, 2004 Sumatera Earthquake and Tsunami on Physical Infrastructure *Journal of Earthquake Technology* Vol **42**, No4 Hal 79-94
[24] Jokowinarno and Dwi 2011 Mitigasi Bencana Tsunami Di Wilayah Pesisir Lampung *Jurnal Rekayasa* Vol **15** No 1, April 2011
[25] Wesnawa, Astra I Gede and Christiawan Putu Indra 2014 *Geografi Bencana* (Yogyakarta: Graha Ilmu)
[26] Adiyoso, Wignyo and Kanegae, Hidehiko 2013 *Efektifitas Dampak Penerapan Pendidikan Kebencanaan di Sekolah terhadap Kesiapsiagaan Siswa Menghadapi Bencana Tsunami di Aceh, Indonesia* Majalahindd Spread 23 of 44 – Pages (66, 23) Edisi 03/Tahun XIX/2013
[27] Imamura F 2009 Dissemination of information and evacuation procedures in the 2004- 2007 tsunamis, including the 2004 Indian ocean *Journal of Earthquake and Tsunami* **3** 2 59–65
[28] Goto Y, Affan M, Agussabti, Nurdin Y, Yuliana DK, Ardiansyah 2012 Tsunami evacuation simulation for disaster education and city planning *Journal of Disaster Research* vol **7**, no 1, pp 1-10
[29] Baedaa Y, Achmad R, Taufiqur U, Hasdinar S, A Dadang 2014 Mitigation plan for future tsunami of Seruni Beach Bantaeng *2nd International Seminar on Ocean and Coastal Engineering, Environment and Natural Disaster Management, ISOCEEN 2014 Procedia Earth and Planetary Science* **14** (2015) 179 – 185
[30] ICHARM-UNESCO 2010 *Report on the international workshop on sustainable tsunami disaster management: developing awareness, hazard mapping and coastal forest implementation* ICHARM Publication no19
[31] Morin J N, Flohic F, and Lavigne 2008 Tsunami resilient communities' development in Indonesia thorugh educative actions *Disaster Prevention and Management* **13** (1), 39-49
[32] Murata, S, Imamura, F, Katoh, K, Kawata, Y, Takahashi, S, and Takayama 2010 *Tsunami: to survive from tsunami* (Singapore: World Scientifi c)
[33] Kongko, Widjo, Hidayat, and Rahman 2014 Earthquake-Tsunami in South Jogjakarta Indonesia: Potential, Simulation Models, and Related Mitigation EffortsIOSR *Journal of Applied Geology and Geophysics (IOSR-JAGG)* e-ISSN: 2321–0990, p-ISSN: 2321–0982Volume **2**, Issue 3 (May-Jun 2014), PP 18-22