Risk Culture on Sebesi Island: Examining the Interplay of Nature and Culture from 1883 to 2018

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ABSTRACT
The Sebesians have been living on a small island near Mount Anak Krakatau, making them susceptible to disasters due to the limited resources in the region. Despite this, the people are unwilling to leave the island as they have been living there since the 1940s. Moreover, the island's natural environment is closely connected to the geological activities of the Sunda Strait. Still, the Sebesians believe Anak Krakatau is not hazardous based on their knowledge of its behavior. The 2018 Sunda Strait tsunami has led inhabitants of this island to reassess their perception of Anak Krakatau. Therefore, this study explores the social experience of the Sebesians exposed to Tsunami 2018 by analyzing the geological history of Sunda Strait areas, including Sebesi island, and the manifestation of risk culture. The concept of risk culture aims to comprehend, measure, and change individuals' risk perceptions and behaviors as part of social groups or larger community organizations (Streicher, Eller, and Zimmermann, 2018). From a historical perspective, the study examines how risks are evaluated and managed and what is considered acceptable. In conclusion, the Sebesians' risk culture is the result of their tangible experience of the 2018 tsunami and other risks faced in their daily lives. In response to this, they developed *absencing* attitude to enable them to live life after the disaster, thereby confirming the nature of the fatalistic view among the Sebesians in considering the reality of their surrounding environment.

Keywords: *Nature, Environmental Hazards, Culture, Risk, Perception*

1. INTRODUCTION

The people residing around the South Lampung and Banten areas, including the Sebesi Island, witnessed a rare occurance of sea waves, on December 22, 2018, and this reminded them of the 2014 tsunami incident which occurred in Aceh. The tsunami hit the Sunda Strait region without prior notice and claimed more than 400 lives, including a five years old boy who was swept away by the waves in Sebesi island.[1] The island that lies 20 KM or approximately 10.7 nautical miles from Mount Anak Krakatau is presumed that the people residing in Sebesi Island already have knowledge of their environment.

The PVMBG or the Center for Volcanology and Geological Hazards Mitigation is a government institution, whose responsibility is to observe the volcanic activities around Indonesia, including Anak Krakatau. They had detected an intensified eruptive activity of this mountain since October 2018. Therefore, in early December, the PVMBG assigned second-level alert status to Anak Krakatau. On Friday, December 21st, 2018 its activity increased sharply marked by its continuous explosions that reached 738 meters above sea level. In line with massive reports about the tsunami which occurred on a Saturday night December 22nd, 2018, the Meteorology, Climatology and Geophysics Agency (BMKG) collaborated with PVMBG to investigate the causes of the event. According to their investigation, this volcanic eruption triggered landslides on 64 hectares of the southwestern slope at 20:56 WIB, hence, instigated tsunami waves that hit its surrounding island (Syamsidik, et.al., 2020; Zengefinnen, et.al., 2020).

[1] Personal Communication with Mr. Wahyu Hidayat, Head of BPBD South Lampung Disaster Management, on September 16, 2022

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The 2018 tsunami provided a new experience for the Sebesians, thereby creating awareness that they reside next to the source of hazards. This reality does not necessarily cause people to leave island, rather they opt to remain due to various reasons. These include concern for their assets and sources of income. Apparently, the people preferred to "coexist with Anak Krakatau."

2. THEORETICAL REVIEW

The people living on this island is vulnerable to the dangers caused by the geographic conditions. Braudel stated that this led to alterations in the historic structure of human activities due to changes in natural physiography (Burke 2003, 229). The relationship between humans and nature consistently plays an important role in terms of understanding any subject in history. Additionally, Braudel focuses on general trends associated with the structure of society, civilization and the state. This include economic systems, technological and scientific developments, political institutions, wars, etc. Therefore, Braudel is known as a structuralist (Burke, 2003).

The threat of disaster is referred to as risk, defined as an uncertainty that can occur in the future, informed through past events, alongside possible recurrence. Risk helps people to understand, accept, classify and manage disasters and hazards over time. As a theoretical concept, risk is not a fact, but an artefact, or a tool used to bring together existing objects, events, or entities that can cause disaster or harm others (Burgess, 2019). Based on a historical perspective, it is perceived as how people construct, accept, and mitigate or deal with risk. In historical debates, the concept of risk support, is for both individuals and institutions, to describe various situations. Risk helps individuals to understand how communities in the past evaluated and discussed dangerous phenomena, as well as when the evaluation process was altered. Historical studies have benefited greatly from risk-related sociology, particularly those of Beck and Giddens. The concept that risk is characteristic of future-oriented society and part of human decisions inspires, shapes, and influences historical debates and analyses of related studies (Itzen and Mueller, 2016).

Historical studies focus on the processes surrounding risk formation and the emergent responses. The historical debate explains three important aspects, namely (1) the continuous description of the current and future visions of the actors involved, (2) when risk is highly dependent on human actions and perception, and (3) the focus of its history on consequences resulting from risk associated with social conflict. Therefore, human reaction or responses to risk is the main reason that led to the development of a civilized society. Historically, it was recorded that society endures changes and development in response to risky challenges. Risk-related historical study provides an explanation of various learning processes and adaptation thereby leading to the formation of new risk regimes that helps the people to understand why a society can survive in a risky (Itzen and Mueller, 2016).

Meanwhile, risk culture is a holistic approach, which includes perception, awareness, understanding, memory, and behavioural practices in preventing risk or avoiding harm. In this study, it refers to a shared understanding of risk constituents, how these are assessed, dealt with and what risk are acceptable. Risk culture aims to explain, understand, measure, and change the individual's perception and behaviors as members of social groups or broader community organizations (Streicher, Eller, and Zimmermann, 2018). Giddens also stated that risk culture is a fundamental aspect of modernization, where awareness is an instrument used to conquer the future. In regard to this, awareness on how to deal with risk and everyday experiences should be considered as a form of a socio-cultural perspective (Giddens, 1998:27-28).

This study aims to seek the existence of risk culture in Sebesi island by analysing its geo-morphological formation and that of the Sunda Strait. Furthermore, the level and dimensions of risk culture matrix designed by Steicher et al, (2018), serves as a frame work capable of integrating existing risk. The study commences with a brief description of the disasters that have earlier occurred on Island, followed by its historical construction and those of Sunda Strait. Subsequently, it explores the individual perspectives of the various risk and reviews the disaster's response in the community. Finally, this study provides an analysis of the Sebesi community who 'surrendered' their fate to nature in terms of facing environmental hazards as well as their responses and subsequent life choices.

3. METHODS

This study analyses risk culture in Sebesi Island from a historical perspective. As an empirical study, it employed an oral historical approach and archival study to examine risk culture. This approach focuses on the common perception of individuals in Sebesi, which connects them with the existing historical context. The application of archival study is mainly based on newspapers published during the study period. This is due to the rare availability of written sources and because Sebesi is only a small island among numerous others under the jurisdiction of the colonial government,

hence, it was quite overlooked. The oral history has been proven to be an effective approach to reconstruct the Sebesians' perception of disasters.

Oral history is information about past events, directly reiterated by historical figures, actors or people who witnessed them, with the help of recording media as an effort to save the acquired information. It is a form of creating archival treasures about past events, especially when there are lacks of archives in the form of photos or textual information about these incidents. Therefore, to save information on historical events, it is necessary to understand its oral history by conducting interview sessions with the narrators who are completely aware of the story. The history of spoken words is a powerful tool for analysing and evaluating nature of historical memory processes. It simply means how people interpret time in the past, relate individual experiences from a social context. This includes how the past is part of the present, and the way people use oral sources to interpret their lives and the world around them (Erman, 2011). In this study, the interviews were conducted during field research with 60 people in four hamlets, mainly with village elders for historical accounts, village officers, and individuals who have been personally affected by disasters, with focus groups consisting of individuals living in both at-risk and safer areas. Additionally, interviews were conducted with cultural experts and official from BPBD Lampung province and South Lampung province related to disaster rescue and mitigation.

4. FINDINGS & DISCUSSION

4.1. The dynamics of Geological aspect in Sebesi Island

The geological formation of Sebesi Island portrays its level of stability and vulnerability to various natural disasters. Therefore, it is important to analyze the development process since it reflects valueable capabilities. Sebesi Island lies in the Sunda Strait region, an area close to the Anak Krakatau's Volcanic activities as well as the earthquake alert zone. These geological conditions directly affect the environment and lives of humans who reside in this region. On the one hand, the rocks and soil, landscapes, and air are geological factors that support human survival. On the other, natural geological processes are perceived as obstacles that affect human existence, such as earthquakes, volcanic eruptions, tsunamis, liquefaction, etc.

Sebesi Island is in Lampung Bay with coordinates of 05°055'37.43"-05°058'44.48" South Latitude and 105°027'30.50"-105°030'47.54" East Longitude. It has an area of 2620 hectares; currently, 787 families, or about 2795 people, live on the island. Lampung Bay borders Sebesi island and Sebuku Island in the north, the Indian Ocean in the west, the Krakatau Islands complex—including Mount Anak Krakatau—in the south, and the Sunda Strait in the east. Based on its administration, Sebesi island is included in the administrative area of Tejang Village, Rajabasa District, South Lampung Regency. In Tejang Village, there are four hamlets: Hamlet I Bangunan, Hamlet II Inpres, Hamlet III Regahan Lada, and Hamlet IV Segenom (Riskianingrum&Yogaswara, 2022).

Figure 1. The Map of Sebesi island
Source: [Biologi LIPI 2020, with the data gathered from field research in October 2020]

In addition, the construction of Sebesi Island is inseparable from the formation of the Sunda Strait. Based on a Geological study, the Sunda Strait was formed as a result of the long-term tectonic activities witnessed in this region. The area between Java and Sumatra is marked as a transition zone due to changes in the direction and subduction's speed of the Indo-Australian and the Eurasian plates. A study conducted in 1995, stated that the opening of the Sunda Strait was caused by the north-west movement of the Sumatra block along its fault (Malod, et.al., 1995). Hall (1997), further stated that the separation between Java and Sumatra occurred due to the fracture. Initially, during the Upper Miocene era, these two islands were merged. Some studies believed that the fracture was initiated by the eruption of ancient Krakatoa in 416 AD.[2] Handayani and Harjono (2008), reconstructed the expansion of the Sunda Strait by using the following figure:

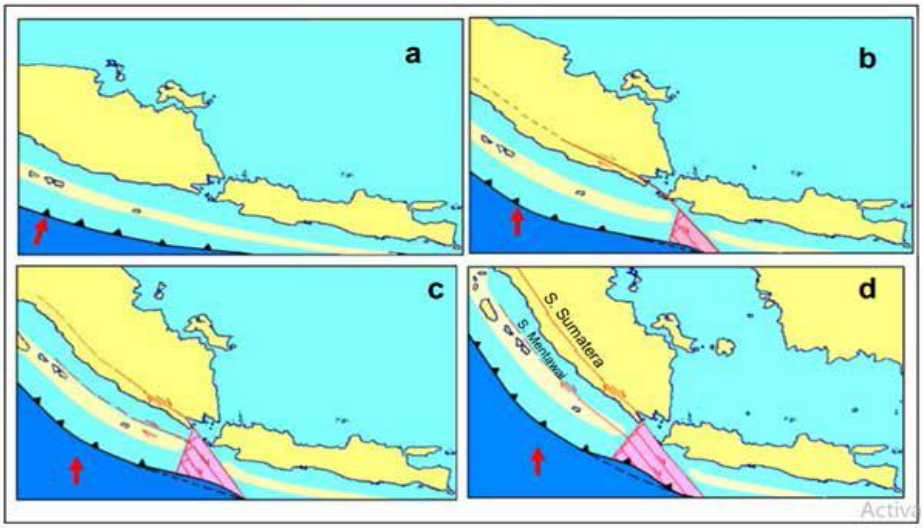

Figure 2. The Process of Sunda Strait formation based on study
Source: [Handayani dan Hardjono, 2008]

Figure *a* show the post-fracture condition, although without any extension yet. The forearc structure along Sumatra and Java is assumed to be uniform. This condition tends to occur when the direction of convergence is perpendicular to the trough and the Indian Plate has not yet stricken the Eurasian Plate (before ~50 million years ago, Zhu, et.al., 2005). Furthermore, Figure *b* shows that there was a convergence between the Indian and the Eurasian Plate, causing changes in the movement of the surrounding plates. As a result, there was movement on the Sumatran fault near the trench and this formed a pull-a-part basin. The formation of this basin occurred continuously, thereby leading to the formation of an extension zone in this area (Handayani & Harjadi, 2008).

In figure *c*, the opening caused by the extension triggered the rupture of the accretion edge between Sumatra and Java, as Sumatra shifted towards the northwest. The shift resulted in the growth of a new fault in the Sumatra forearc area, namely the Mentawai Fault. Meanwhile, figure *d* shows the structure of the basin (pull a-part basin), formed due to constant extension till date. This extension area continues to widen as the trough line curves (Handayani & Harjadi, 2008).

In respect to the four pictures, Handayani and Harjadi concluded that Sunda Strait is the transition zone of the subduction process from Indo-Australia's active tectonic plate with EuraAsia plate in the form of *graben.*[3] These enduring tectonic activities triggered or initiated the Sunda Strait, marked by the occurrence of several earthquakes in these areas (Handayani&Harjadi, 2008). Additionally, the geological and geophysical studies on the Strait Sunda

[2] According to Pustaka Radja Purwa, a book written in the 14th century, a mountain called 'Kapi' was once massively erupted in 416 led to the separation of Sumatera and Java island (Yudhicara&Budiono, 2008; Reid, 2015). Nevertheless, some researchers believed that the ripped of these two islands were established long before the eruption of ancient Krakatau, however due to the eruption, the ripping was extent. Additionally, the tectonic movements also play role for further extension (Nishimura, et.al., 1986; Malod, et.al., 1995; Zhu, et.al., 2005, Handayani&Harjono, 2008).

[3] Graben is a piece of earth's crust that is shifted downward in comparison to adjacent crust known as "horsts" which are shifted upward. Further explanation sees Earthword: Graben in www.usgs.gov

demonstrate that along these area lies not only a north-south trending shallow seismic belt but also a volcanic lineament, believed to be a fracture zone. The lineament's initial developmental stage was at Sukadana and shifted southward through Rajabasa, Sebesi, Sebuku, Panaitan, and ended in Krakatau (Nishimura, et.al.,1986).

The difference in collision patterns led to the formation of an island arc, characterized by oceanic trenches, volcanic arcs, and back arc basins. In addition, there is also an underwater volcano (Krakatau), between the trench and the volcanic arc. This condition also encourages the opening and the development of the Sunda Strait and Sumatran fault systems, namely the Semangko and the Mentawai faults, respectively (Oktariadi, et.al., 2019).

The Mentawai and the Semangko Faults lie along Sumatra and both disappear in the Sunda Strait. These two faults are known as triggers of major earthquakes in the Sumatra region. The existence of these faults also contributes to the formation of the Sunda Strait, which tends to have wavy and steepy land seabed topography. The oceanic trench in the Sunda Strait, located at the boundary where the plates meet, is the area most likely to produce strong earthquakes (Yudhicara and Budiono, 2008). Furthermore, two of the three seismic zones are clustered under the Krakatau complex. The tectonic conditions in this area are so intense that they can trigger earthquakes with magnitudes reaching approximately six on the Richter scale. Based on a study conducted in 1995, it was stated that the Mentawai, Sumatran and Sunda Strait faults moved at a speed of relatively 15mm/year, 23mm/year, and 5mm/year, respectively (Malod et.al, 1995).

Nishimura et.al (1986), stated that the Sumatra island underwent a clockwise rotation of 20 degrees to the north since two million years ago. The rotation led to the widening of the rift between Java and Sumatra. This is recorded from the rock cracks that exist in the area. The study, conducted since 1981 to 1983, stated that the volcanic lineament in the Sunda Strait along the Panaitan Island Volcano, Sebesi Island, Sebuku Island, Mt Rajabasa, and Anak Krakatau leading to the Sukadana Volcano area is also a north-south active fault line. The rip in the fault released magma in the Earth's upper mantle, which migrated to the surface in the form of island volcanoes. The order is supported by the existence of a relatively large magma reservoir in the Sunda Strait region, especially under the Krakatau sea, along with its high volcanic activities (Harjono, Handayani, & Mukti, 2017). This was the driving force for the emergence of volcanoes on island of Panaitan, Sebesi, Sebuku, Krakatau, and Anak Krakatau. These island volcanoes appeared to surface at different times, and this confirms the notion that the volcanic alignment is a fault zone. (Nishimura, et.al., 1986).

The Sunda Strait fault plays an important role in terms of controlling the emergence of volcanoes in this region. Sidarto, drr (2017), stated that this fault played a significant role in the emergence of the Ancient Rajabasa Volcano during the Upper Miocene era (approximately 19.9 million years ago), as well as the possible formation of the Panaitan volcano island during the same period. Furthermore, this growth was followed by the emergence of the Sebuku volcano island, which was a volcanic cone of the Ancient Mount Rajabasa in the Pleiocene era (relatively 10.8 to 5 million years ago). This study stated that inside the Rajabasa Purba caldera appeared the Pandan volcano during the Pleistocene era (relatively 2.5 to 1.8 million years ago). The recent mount Rajabasa appeared during the Holocene era (around 11 thousand years ago), from the crater of the Pandan volcano. This growth was followed by the appearance of the Sebesi volcano island in the Resent period and continued with advancement of the active Krakatau. Volcanoes that line up and appear simultaneously shows nature of chain volcanoes in this region, it simply means, assuming one volcano dies, another will appear (Sidarto, et.al., 2017). [4]

Historically, the Sunda Strait have repeatedly experienced shocks whose strength is greater than six in the Richter scale, with relatively shallow depths, and vertical earthquake mechanisms. Gutscher and Westbrook (2007), as quoted by Yudhicara and Budiono (2008), stated that tsunami triggered by earthquakes is generally associated with slow subduction zones. These subduction zones usually produce earthquakes with a large thrust fault mechanism or mega thrust earthquake with a strength of >8.2 Richter. The Aceh earthquake on December 26, 2004 was an example of a slow subduction zone tsunami. The speed of the Sunda Strait subduction zone is indeed two to three times faster than the subduction zone in the western waters of Sumatra, but slower than the one in South Java, approximately 5mm/year (Yudhicara and Budiono, 2008).

[4] Based on interviews with several elders and villagers explained that the Sebesi was once an active mountain but then ceased due to the initiation of Krakatau (they failed to explain when it happened). Further, one fisherman, called Herman, narrate his experiences that his boat was hired by several researchers from Bandung to visit Gubuk Seng area in 2014 where they found lava formed stones. These informations were confirmed through a research conducted by PVMBG in 2019 (Oktariadi et.al, 2019).

Apart from tsunami due to the earthquake, the Sunda Strait water is also threatened by a tsunami from volcanic activity, which is frequently experienced in this area, although currently it emanates from Mount Anak Krakatau. Yudhicara and Budiono (2008), stated that tsunamigenic is a natural event which potentially generates a tsunami. The event is marked by the disturbance of sea water as a result of volcanic activities, coastal and underwater landslides, and other causes. Tsunami are not only caused by eruptions, but also as a result of falling volcanic products that spew out into the sea, or the collapse of part or an entire volcano's body into the sea.

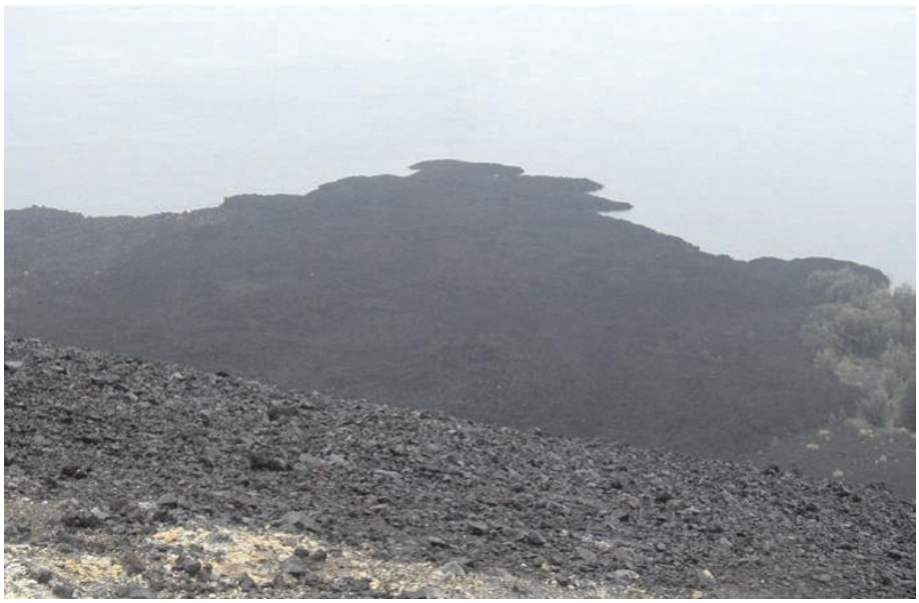

Figure 3. The volcanic products from Anak Krakatau which ejected into the sea in 2017.
Source: [Yudhicara dan K. Budiono, 2008]

Soloviev and Go (1974), compiled a catalogue of tsunamis in Indonesia, and these were further studied by Yudhicara and Budiono (2008), mainly on Sunda Strait region. The catalogue shows that an earthquake that caused a tsunami in the Sunda Strait occurred in 1757 with a magnitude of 7.5 on the Richter Scale and a water level of approximately one meter. Based on the time span of the last event, there has been a seismic gap in this region reaching more than 250 years (Yudhicara and Budiono, 2008).

Table 1. The list of Tsunami events in Sunda Strait based on Soloviev and Go catalogue, 1974

Year	Description of the Tsunami
416	Javanese books entitled "Book of Kings" (Pustaka Radja), recorded several eruptions in Mount Kapi*, thereby causes rising sea waves, which inundated the mainland, and separated P. Sumatra from P. Jawa. *) Presently, mount Kapi is believed to be a volcanic Krakatoa
October 1722	There was a strong earthquake at sea, felt in Jakarta and this caused the seawater to rise like boiling water
August 24, 1757	At 02:00 AM, a strong earthquake was felt in Jakarta more or less for five minutes. Meanwhile, at 2:05 a.m., the strongest movement was felt, and the wind emanated from the northeast. Ciliwung river water overflowed to relatively 0.5 meters and flooded the city of Jakarta.
May 4, 1851	In Teluk Betung Bay, inside Lampung Bay, on the south coast of Sumatra island, tidal waves rising 1.5 m above regular tide observed.
January 9, 1852	Immediately after 18:00, an earthquake was felt from the western part of Java to the southern part of Sumatra. This earthquake was also felt in Jakarta, and its aftershocks also experienced in Bogor and Serang. Meanwhile, precisely at 20:00, there was unusual sea level fluctuations.
August 27, 1883	At 10:02 a.m., there was a violent eruption from the volcano Krakatoa, followed by a tsunami wave. The maximum height of tsunami observed in the Sunda Strait was relatively 30 meters

October 10, 1883	In Cikawung, on the beach of Selamat Bay, sea waves that flooded the beach were observed as far as 75 m
February 1884	Five months after the eruption of the Krakatau volcano, a small tsunami was observed around the Sunda Strait.
August 1889	Unusual sea level rise was observed in Anyer, West Java.
March 26, 1928	The eruption of the Krakatau volcano was accompanied by rising sea waves observed in several places in the vicinity of the volcanic area.
April 22, 1958	At 5:40 am, an earthquake was felt in Bengkulu, Palembang, the Bay of Banten and accompanied by the gradual rising of the sea level.

Source: [Yudhicara dan K. Budiono (2008), p.243]

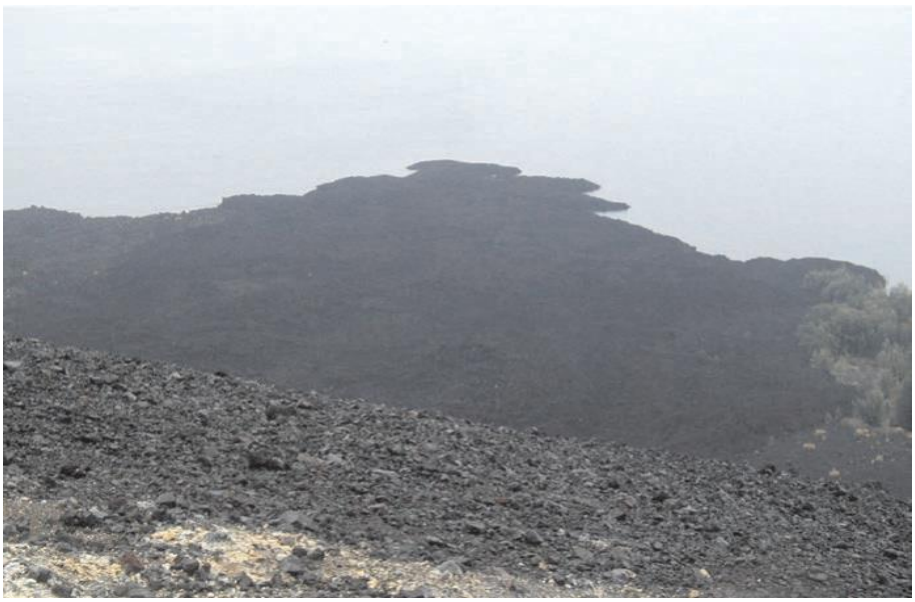

Figure 4. The Flank collapse in Anak Krakatau which resulted to tsunami (tsunamigenic) on December 22nd, 2018
Source: [https://www.itb.ac.id/berita/studi-terbaru-anak-krakatau-letusan-2018-yang-kuat-bukan-penyebab-runtuhnya-tubuh-anak-krakatau/58351]

Figure 5. The difference of Anak Krakatau on August 5th, 2018 (upper) with the condition after the tsunami(below) where the picture taken on January, 13th 2019
Source: [kumparansains pada https://kumparan.com/kumparansains/perbedaan-anak-krakatau-saat-setinggi-338-meter-dan-menyusut-110-meter-1547509234726807289]

Based on its morphological form, the Sunda Strait water, including the Sebesi Island, tends to have steep and deep valleys. The relief condition indicates the existence of a seabed river channel pattern. With such circumstance, this area tends to experience strong currents and high potentials for the occurrence of landslides or mass movements (Kuntoro, 1997). On December 22, 2018 the Sunda Strait tsunami confirmed the potential for avalanches in this area, and the collapse was also triggered by increased volcanic activities in Mount Anak Krakatau since April 2018 (Syamsidik, et.al., 2020).

In accordance with its historical geology, Sebesi Island is resulted from the release of magma due to the ripping of tectonic activity in this region. This island lies in the area of potentially earthquakes hazards due to the structure of Sebesi-Sebuku fault. Furthermore, the intense volcanic activities in Anak Krakatau—since it has a large magma reservoir—poses another threat of natural hazards for Sebesi Island. The natural environment confirms that this island is exposed to natural disaster, hence proper planning and management is needed to anticipate the peril of various natural hazards.

4.2. In Search for Risk Culture in Sebesi Island: The Dimension and Level Matrix Approach

In this study, risk culture refers to a shared understanding of the constituents of risk, its assessment, how to deal with and accept challenge. This implies that the concept of risk culture aims to explain, understand, measure, and change risk perception and behaviors of individuals belonging to diverse social groups or wider community organizations (Streicher, Eller, and Zimmermann, 2018). Offering a risk culture model, that is a matrix consisting of three dimensions and three different levels, Steicher et.al (2018), examined it as an important agency in the society. Moreover, it does not stand alone, this dimension are related to each other. The dimensions in this model refer to (1) person, namely risk-related factors on the individual side, (2) social, namely shared experiences in making joint decision. These include social norms, rituals, diversity within a sizeable group, (3) structure, which is related to the existence of formal and informal systems in the context of decision-making processes, responsibilities, accountability, norms and regulations, as well as organizational concepts.

Additionally, level refers to agent's behavior, both visible and invisible. The three levels described in the study are *artifacts*, in this case all visible, measurable and observable forms found in society. *Espoused beliefs and values* reflected in the strategy, agenda, philosophy and principles related to risk. This refers to a shared understanding without further observation. *Basic assumptions* are the last dimension in this disaster risk model which describes feelings, cognitive states and representations, thoughts and learning implicitly from shared experiences (Steicher et.al., 2018).

Table 2. A Three Dimensions and Three Level Matrix by Steicher et.al (2018)

Level of risk Culture	**Dimension of risk culture**		
	Person	**Social**	**Structure**
Artifacts	• Risk judgment • Risk behavior • Social demographics • Individual performance	• Diversity of groups • Formal group norms • Leader behavior • Group performance	• Organizational structure and hierarchy • Formalized decisionmaking process • Risk management • Risk and safety rules Implemented FFTs
Espoused beliefs and values	• Personal motives, • values, and beliefs • Professional identity • Accepted rule violations • Routines	• Informal group norms • and identity • Perceived hierarchy • and social status • Leader expectations • Ownership of rules and tolerated violations	• Organizational identity • Actual decision making • process and error • handling • Goals and values • Organizational (lack of) control
Basic assumptions	• Loss and gain perception	• Shared experiences • Perceived expectations of others	• Implicit organizational rules

	• Negative and positive feelings • Cognitive biases • Gut feelings • Intuition	• Group rituals • Group biases	• Organizational narratives • Organizational rituals • Defensive decision making

Source: [Streicher, Eller, and Zimmermann, 2018]

Table 3. Risk Culture in Sebesi based on A Three Dimensions and Three Level Matrix by Steicher et.al (2018)

Level of Risk Culture	Dimension of Risk Culture		
	Person	Social	Structure
Artifacts	• Mount Anak Krakatau as risk • observe the mountain as its activities exposed • Sea wave observation during high tide and active eruption • *Jaseng* identity • *Lampongers* identity • *Hybrid* Identity	• The Sebesians consist of Banten descendant (the so-called Jawa-Serang or *ja-seng)* at about 70% of the total population • The people from Lampung descendant at about 20% • People from other tribes, such as Batak, Bima, Bugis Sunda and Jawa, at about 10% of total population. • Culture and values of Bantenese • Culture and values of Lampongers • Both major cultures are living harmoniously	• The village official structure • The signs and pathway of evacuation built by the government (both by centre and local) • Texting activities through WA group, informing each other via telephone when Anak Krakatau active. The awareness to remind each other in relation to their surrounding environment. • Initiate night watch group among villagers during the eruption. • A commemoration of tsunami by inviting *Kyiayi* or *Habibs* from Jawa or others area
Espoused beliefs and values	• When the mountain is active, then they believe that they are safe • When it calms for a long period, they become worried because they believe it would be more threatening • Continue to do their own activities, such as planting, harvesting, or fishing in the sea, regardless the	• Head village as highest hierarchi in society in Sebesi • The owner of island, elders, and religious leaders are those who received high status in informal structure on Sebesi's society • Resulted to community that comply with the formal status of local government • In addition, it also created a society that obey their informal structure	• A divided society, one side is a group who support the government and a group that obey the informal leaders, in this case the island owner • A neutral group disregard to conflicted groups • Local convention become one effective tools in controlling formal organisation • The elders and *Kyiayi / religious leaders* play roles in

	condition of Anak Krakatau • The changing of perception after 2018 tsunami, some people stay alert when this mountain active		controlling informal organisations • Head village and its apparatus as formal leaders of the society • Informal gathering in stall or weekly reciting (*pengajian mingguan*) are effective tools to spread news.
Basic Assumption	• Anak Krakatau is a blessing since it entices tourists to visit Sebesi • Anak Krakatau help make Sebesi's land fertile • Tsunami 2018 transformed their view from blessing to risk that can bring disaster to their island • If the hazards come from sea, then they avoid beach and run off to mount Sebesi • If the disaster come from the mountain, they flee to the beach	• 2018 tsunami became collective memories of people in Sebesi • *Bancakan**, *Rabu Pucuk**, dan *Haul** dan other religious rituals based on Islamic view with the aim to seek for protection and bless from any disasters • Some community still actively conducted the traditional rituals outside islamics rules • All technological tools as means to warning people from disaster in Sebesi considered less effective compare to pray, communication, and surrounding observations	• Follow the orders of elders and religious leaders • Be a faithful person according to Islamic faith as disaster prevention • The society believe that a reason why Sebesi were quite safe without any fatal destruction because of blessing and its devotion to their religion • The government as the main responsible that help the community in facing the disaster

Source: [indepth interview during field study from October 2020- September 2022, Focus Group Discussion on September 20, 2022 in Pendopo Desa Tejang, and structured interview with the community in four hamlets, namely Dusun Bangunan, Dusun Inpress, Dusun Segenom, and Dusun Regahan Lada]

In Based on Tables 2 and 3, it can be concluded that the Sebesians understand the implications of living side by side with an active mountain. The experience of 2018 tsunami changed their perception on this mountain from a wonderful phenomenon to a risk. The Sebesians are aware that the disaster triggered by Mount Anak Krakatau can occur at any moment, however their reluctance to leave island is due to the feeling of 'home' and the economic needs derived from island. Many the Sebesians believe that when the mountain is active, the possibility of a major eruption is minimal. They also assume the 2018 eruption which led to tsunami was mainly caused by the dredging activity of sea sand around Anak Krakatau.[5] The 2018 tsunami prompted a new mindset in the community, which is the non occurrence of another major disaster in the near future due to the shrinking of the mountain.

In addition to changing perception on Anak Krakatau, the tsunami experience also created a sense of disaster awareness among majority of the Sebesians. The Sebesians began to pay more attention to their surrounding environments, avoided deep sleep, built temporary houses on Mount Sebesi, and prepared a *tas siaga bencana* or

[5] Interview with Mr. Tubagus Nawawi on 14 April 2021, Bapak Hayun on 15 April 2021, and Baak Qurtubi on 16 April 2021. For further info, see Fulistiawan, H. (2019, September 4). Warga Pulau Sebesi Tolak Penyedotan Pasir Laut Gunung Anak Krakatau. dalam KORAN SINDO, edisi 4 September 2019. Retrieved from https://daerah.sindonews.com/berita/1436431/174/warga-pulau-sebesi-tolak-penyedotan-pasir-laut-gunung-anak-krakatau. See also https://daerah.sindonews.com/berita/1436431/174/warga-pulau-sebesi-tolak-penyedotan-pasir-laut-gunung-anak-krakatau

'disaster preparedness bag' whenever the mountain exposed its activity,[6] but they tend to behave 'as usual' towards natural conditions. This attitude indicates that the natural environment and volcanic activities of Anak Krakatau are still within the acceptable risk of the Sebesians, as reflected by the continuous daily activities in island. The vigilance of the Sebesians is highly dependent on the eruption level of Anak Krakatau. When it's just a roar and a short-lived smell of sulfuric acid, the people tend to respond casually. However, a long-lasting activity over a prolonged period, as experienced between May and July 2022, prompts an increased vigilance by the community. Patrol groups are formed and the Sebesians are reminded to keep bags containing important documents handy.

The Sebesians dispel fears by conducting routine activities and monitoring Anak Krakatau through communication. The manner of response to the mountain is in line with the practice of *absencing*, which is the act of decreasing risk and disaster memories in order to enable living in the environment (Monteil, Barclay, and Hicks, 2020). In the context of everyday risk calculation, Anak Krakatau is not perceived as a highly potential risk by the Sebesians, as it is relatively less important on their timescale.

Furthermore, religious activities are believed to be artifacts which prevent future disasters. Island, whose entire population is Muslim, believe that disaster occurs when religious orders are neglected. These orders include praying five times a day, reciting the holy Quran, and abstaining from prohibited activities by religion, such as getting drunk and acting immorally. This belief is spread by religious leaders and village elders, who play an important role as informal leaders in the social structure of Sebesi community. The attitude of the formal leaders namely the village and hamlet heads, also tends to comply with these rules. Both formal and informal leaders' function as agents of unity, thereby playing a major role in the community.

The community compliance is inversely proportional to the act of 'trust' in terms of disaster preparedness. The Sebesians tend to trust their own observation and surrounding tools rather than the existence of sophisticated systems installed by the government. Majority of the people including elders and religious leaders, believe that electric poles and *kentongan* are more effective than the early warning system. This is because the access to several systems constructed by the government is limited to specific application and to some village officials, while other the Sebesians are often neglected. Furthermore, tools and systems are prone to damage and depend on the supply of electricity, while *kentongan* and electric poles can be used at any time. The people accepted the government`s provisions but still developed their own conception. This behavior is a response to their natural environment which is vulnerable to disaster, and also encourages the thriving of *absencing* attitude in the community. *Absencing* is a form of risk behavior by individuals as members of a wider social group or community organization. The economic burdens are responsible for the Sebesians resolve to accept risky circumstances in order to survive on island.

Based on the matrix of Streicher et.al (2018), the attitudes of the Sebesians indicate the existence of a risk culture on Island. This culture infuences the people`s behavior, build perception and knowledge, as well as develop a better response to future hazards and disasters. Risk culture is not universal but is peculiar to each community. This difference in characteristics is based on the acceptable level of existing risk, varying risk competences, and different risk encountered in the community. The existence of Anak Krakatau was considered hazards by the Sebesians after the 2018 Tsunami. However, the acceptance level of risk from Anak Krakatau and surrounding environment is relatively high as evidenced by the Sebesians attitude to co-exist with the mountain, resort to 'life as usual' and 'be alert but absence.'

The knowledge of disaster, in this case the tsunami, was a new experience for Sebesians. History records that the 1883 Krakatau eruption triggered a mega-tsunami with waves as high as about 30 meters, thereby submerging the Sebesi island. The time interval of 138 years was responsible for the faint memory of this disaster (Riskianingrum and Yogaswara, 2022), which subsequently led to low perception on risk and lack of preparedness for such hazards.This low frequency of disaster repititions was responsible for the mindset of being free from threats of disaster. The 2018 tsunami experience led to a change in perception and created awareness in the community. The high level of submission to God encourages the development of fatalism, thereby building less adaptable individuals (Aksa, 2019). As a result, the Sebesi community was less successful in developing an attitude of proactivity in disaster preparedness and resilience.

5. CONCLUSION

Sebesi Island is known for its proximity to Anak Krakatau as well as for its beautiful nature and friendly people. Due to its geological and morphological formation, Sebesi is surrounded by several faultlines and volcanic lineament. Furthermore, island is exposed to various natural disasters, ranging from earthquake, volcanoes, and tsunamigenic. The

[6] Riskianingrum, D., et.al. "The Memory and The Perception of Risk in Pulau Sebesi." Paper presented on AIWEST Conference – Inclusive and Integrated Disaster Risk Reduction 2022, Sidney, 29-30 September 2022.

community originally viewed Anak Krakatau as a blessing volcanic-island which is a source of fertile soil for agriculture, and a tourism development site (Riskianingrum and Yogaswara, 2022). However, the proximity of this mountain turned out to be hazards to the Sebesians thereby slowly changing perception of Anak Krakatau as a blessing island.

The December 2018 eruption became the turning point when its activities caused a collapsed flank which led to a tsunami. After that incident, booming sounds, smoke from the mountain peak, and sulfuric smell are subsequently responded to with a sense of fear, circulation of messages through WhatsApps application in order to remindone another of the need for vigilance, as well as other actions to monitor natural situations, such as observation of the sea waves and surrounding. Perception of the Sebesians Island towards Anak Krakatau is currently changing from a blessing to hazards but the community opted to stay on Island for various reasons ranging from the existence of livelihoods, assets and families. The Sebesians prefer to adapt or coexist with Anak Krakatau.

Based on fatalism, the Sebesians tend to assume that disasters are unavoidable and are related to destiny and natural forces. This leads to a tendency to have low trust in the local government on issues of disaster prevention and preparation. Hazards events are regarded as unlucky, God's punishment, destiny, as well as the state of nature. The diverse perception of people depict powerlessness in dealing with nature, weakness to confront exploitative behaviour toward nature, and inability to be decisive in their lives. This implies little attention and effort to build risk preventive measures. Therefore, a risk culture exists in the Sebesi community with a relatively high level of risk's acceptance. The attitude of *absencing* was developed by the Sebesians as a response to existing risk in a way to continue live after disaster in the environment. This behaviour leads to a disregard for warnings of future risk.

The feeling of powerlessness and inadequacy of the Sebesians in facing disasters is in line with the fatalistic approach. In this approach, hazards are accepted as something unpredictable and unavoidable, because disasters are believed to be extraordinary events or the result of extraordinary actions, or even actions of supernatural powers. Therefore, neither the government nor society is capable of preventing disasters, effectively deal with crisis situations, or minimize the consequences of disasters for communities. Based on this approach, disaster prevention is not a top priority in this risk culture, leading to a low risk awareness and development of disaster adaptation strategies.

However, fatalism in the context of the Sebesi community is not regarded as a 'primitive' form of belief which characterizes a less developed and more traditional society. This approach to risk and disaster emerges when people perceive the inefficiency of existing risk mitigation. The feeling develops due to lack of solutions to reduce anxiety and fear. This study confirms that a fatalistic approach is often related to the widespread distrust of the community towards the existing authorities accompanied by the weakness of individual self-confidence in dealing with crisis situations. The maintenance of a continuous communication between the related authorities and the local community about awareness of hazards and disaster mitigation is an alternative solution to building trust in government as well as building confidence that the community is capable of being an actor in preventing disasters.

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