

The Role of Indonesian Airforce in Disaster Management for Assisting with Natural Disaster

Suwaji, Windy Dermawan, Rizki Ananda Ramadhan

Geographically, Indonesia has a high degree of possibility regarding natural disasters. As a state internal security keeper, the Indonesian Air Force should be in the front-line in dealing with natural disasters in line with the mandate of Law Number 34 of 2004, which is “protecting the whole nation and the whole of Indonesia’s blood from threats and disruption to the integrity of the nation and state”. The facts that occur in the field, the Indonesian Air Force still has some problems related to synergy with other institutions and agencies and the lack of defense equipment management. This study employs a descriptive analysis method with a specific data collection technique to validate the findings of this study. Thus, the findings of this study are the Indonesia Air Force need a disaster response SOP, need to enhance the capability and strength of defense equipment, need to establish a permanent unit for disaster management within the Air Force’s organisational structure and establishing contingency budget allocations for the Air Force that are sufficient to carry out OMSP in order to support the TNI’s main tasks. With these steps, a positive synergy will be realised in the operation in the disaster area between all stakeholder involved ultimately give a good impact to the national stability.

Suwaji, Windy Dermawan, Rizki Ananda Ramadhan. The Role of Indonesian Airforce in Disaster Management for Assisting with Natural Disaster. *Central European Journal of International and Security Studies* 13, no. 4: 51–64.

© 2019 CEJISS. Article is distributed under Open Access licence: Attribution - NonCommercial 3.0 Unported (cc by-nc 3.0).



Keywords: air force, natural disaster, standard operational procedure, synergy, national stability.

CEJISS
4/2019

Indonesia is a country that contains three most active volcanoes of all countries in the world; they are the Eurasian Plate, Pacific Plate and Indo-Australian Plate (Indonesia Investments, 2018). This causes Indonesia to experience frequent earthquakes, tsunamis, volcanic eruptions and other natural disasters. From this geological condition, the logical consequence is that Indonesia lies in the Pacific Ring of Fire, which is full of potential natural disasters. One of the newest natural disasters that happened in Indonesia is a massive earthquake that occurred on 28th September 2018 in the Central Sulawesi region with a magnitude of 7.7 SR (World Health Organisation Indonesia, 2018). This earthquake followed by tsunami and liquefaction and caused 2,113 people to die (Nugroho, 2018). The Palukoro fractures that stretches along the Donggala bay has shifted, resulting in an earthquake and tsunami that caused significant casualties and material losses. The destruction of infrastructures and the loss of transportation accesses due to this disaster affected the difficulties in the disaster management process. The Indonesian National Armed Forces as the front guard have to be present in every natural disaster as stated in the opening of the 1945 Constitution that is a national ideal to protect the entire nation of Indonesia and the Indonesian people. The Indonesian National Armed Forces (TNI) as a component of national defense, based on Law No. 3 of 2002, Law No. 34 of 2004, and the Tri Dharma Eka Karma TNI Doctrine of 2018 stated that the TNI has duties in Military War Operations (OMP) and Military Operations Other Than War (OMSP). This duty also applies to the Air Force (TNI AU). In the OMSP, the Indonesian Air Force carries out natural disaster management operations through air support operations which include natural disaster relief, evacuation, and humanitarian assistance activities together with National Disaster Management Authority (BNPB), the National Search and Rescue Agency (Basarnas/BNPP), the Indonesian Red Cross Society (PMI), the Ministry of Social Affairs of the Republic of Indonesia (Kemensos), Air Force Headquarters (Mabasau), Meteorology, Climatology, and Geophysical Agency (BMKG), The local government, and the involved air bases.

The implementation of providing support to the handling of natural disasters by the Indonesian Air Force faced many obstacles and

challenges. The main obstacle in the aspect of cooperation is the lack of synergy between the Air Force and the stakeholders involved (BNPB, BNPP, PMI, the Ministry of Social Affairs, BMKG and the Ministry of Public Works and Public Housing of the Republic of Indonesia (Kementerian PUPR). This has resulted in overlapping authorities between involved ministries/ agencies which caused some technical problems about the executor in the operation area. This problem continues to occur even though it has been contained in the Task Force (Satgas). In additions, there are operational aspects constraints regarding the problem of Indonesian Air Force aircraft flight hours used for disaster management in the earthquake in Central Sulawesi last 2018. The results of the 2018 operation evaluation noted that the use of flight hours is far in excess of the planned flight hour allocation for disaster management operations, including the absence of special budget support in Indonesian Air Force to support disaster management activities. These aspects affected the lack of Air Force's role in handling disasters.

The involvement of the Air Force in handling disasters is something that needs special attention. This is because the use of the strength and capabilities of the Air Force which determine the level of success of operational tasks, not only for the Air Force but also for the success of all other elements of the nation in tackling the disaster that occurred in Indonesia. The synergy between the Indonesian Air Force and other institutions/ agencies that has been running this far needs to be maintained or even to be improved. Therefore, it is necessary to establish policies, strategies and efforts that can optimise the involvement of the Indonesian Air Force through coordination, revision and dissemination of implementing regulations related to the support of the Indonesian Air Force in disaster management including a legal umbrella for integration (Laws and government regulations) that is capable to create synergy and interoperability of information systems for all stakeholders. In addition, we also need to make efforts to propose, procure, and modernize to improve the capabilities and strength of the Indonesian Air Force main defense system tools (Alutsista) in handling future possible disasters. The next effort is to study, submission, and validation of a permanent and structured organisation within the Air Force and establishing disaster contingency fund support for the Air Force so that it is hoped that it can create an optimisation of the Air Force's involvement in disaster management in order to carry out OMSP to support the TNI's main tasks.

Suwaji

Windy Dermawan

Rizki Ananda

Ramadhan

This paper provides an overview of optimising the involvement of the Air Force in handling disasters in order to implement OMSP to support the main tasks of the TNI as a form of emergency preparedness and response by utilizing the potential and capability of the Air Force that has been tested in disaster management in this country.

Theoretical Framework

H. H. Hap Arnold (1949) explains the theory of Air Power where in the World War II the most prominent in the greatness of air power lies in its high flexibility to be transferred from one task to another task easily and quickly (Huston, 2002). Similar to the implementation of humanitarian operations, Air Power in the form of aircraft is also the most prominent because the operation requires speed, responsiveness and flexibility in handling crises. The aircraft functions as air transportation, medical, as well as the task of searching and helping disaster victims must be able to fulfill their duties quick and easily.

The next approach is talking about the theory of Synergy by AF Stoner James (1986) that explained about the Realisation of synergy between the role of the Indonesian Air Force and the institutions/agencies in handling natural disasters (Stoner & Charles, 1986). James argues that the relationship between two parties can produce a certain level of communication that depends on the elements of cooperation and trust between each party. Based on the pattern of work relationships that might occur, it will produce three levels of communication, namely: defensive, respectful, or synergistic (Covey, 1989). Defensive communication is formed due to the low level of cooperation and trust; respectful is formed with high cooperation and mutual trust where communication patterns are compromise and respect each other; synergistic is the highest nature of communication that is formed through high cooperation and mutual trust until both parties trust and sure enough to form synergy. In synergy, the cooperation is strong and able to have a greater output than just the sum of the outputs of each party (the whole greater than the sum of its parts) (Bertalanffy, 1968). This theory is relevant in strengthening cooperation in order to create cross-sectoral synergy between the Indonesian Air Force and all institutions/ ministries in handling natural disasters.

In natural disasters, it is also important to look at problems through the Human Security approach according to the United Nations (1994). Human Security states that human security is the center of gravity and

is the main concern of state policy. The two main categories in Human Security: Freedom from Fear and Freedom from Want. Threats that can interfere the sustainability and existency of Human Security are so many and varied that the UN categorizes them in seven categories, namely: Economic security, Food security, Health security, Environmental security, Personal security, Community security, Political security (Gomez & Gasper, 2013). Natural disasters are non-traditional threats that can one day appear suddenly and disrupt the existence of humanity due to their effects. If related to the seven threats mentioned above, natural disasters are an environmental security threat that results in loss of lives, environmental damage, loss of property, and many more.

Last, discussing TNI synergy will also related to the approach of Civil and Military Relations theory by Huntington (1957). According to Huntington civil-military relations are demonstrated in two ways: Subjective civilian control and Objective civilian control. Subjective civilian control means civil-military relations carried out by minimising military power and enlarging civilian power. If applied too fast, this model can lead to disharmony in civil and military relations because military space is very limited. Instead, civilian power became very broad and became a force that controlled military policy and deployment. The second way, objective civilian control means: professionalism of both parties and mutual recognition of each other's roles; effective transfer of power from the military to political leaders who have the authority to make strategic decisions in the military field; recognition and approval from political leaders on the capabilities and authority of military professionals; as a result there has been a minimization of military intervention in politics and minimization of politics in the military. Objective civilian control is considered a healthier and ideal model of civil-military relations because it is done by enlarging military professionalism without losing its power. The state and politicians still give certain limited powers which are only related to the military field.

To deepen the discussion and see the problem more clearly, the researcher also added several reading sources that can be used to understand the overview of the study. First, "Menggapai Cita-Cita Masyarakat Tangguh Bencana Alam Di Indonesia" by Herryal Z. A and Hery H. (2013) (Anwar & Harjono, 2013). This work is the result of recording from a number of writings about natural disasters in the world

and especially in Indonesia, which is complemented by the experiences of writers and researchers within the Indonesian Institute of Sciences (LIPI). Herryal and Hery studied natural disasters related to disaster risk reduction. The discussion in this study is more focused on natural disasters that are very much threatening Indonesia's earth and harming both the community and government, including earthquakes, tsunamis, volcanic eruptions, floods, and landslides. The difference between this text and the writings of Herryal and Hery (2013) lies in the subject under discussion. This text examines the role of the Air Force while Herryal and Hery present their study in a general way.

"The Conception of Military Operations Other Than War (OMSP) Indonesian Air Force Humanitarian Operation Mission to Overcome Natural Disasters in the Future" by Kabul Haryono (2010). This work states that the earthquake and tsunami on December 26, 2004 resulted in the paralysis of the civil administration in Nangroe Aceh Darussalam (NAD) (Haryono, 2010). Kabul (2010) also explains that the conditions that occur in disaster management are the lack of coordination and unclear management of aid. In such a situation, the strength and capability of the Air Force is the mainstay in handling post-disaster. This study will differ with Kabul's, as it gives different research methodology and problem solving techniques. Kabul (2016) solves problems by offering conceptions while this study solves problems by optimising existing conditions.

Irawan (2006) states that various natural disasters occurring in the territory of the NKRI have resulted in environmental, public facilities, fatalities and property damage and losses. The mitigation efforts due to natural disasters are the responsibility of the government and its people. The TNI as part of the government has the responsibility and role in handling countermeasures due to natural disasters and handling refugees in accordance with the tasks of the OMSP. This manuscript is in line with Dedy (2006) on natural disaster management, and is a continuation of studies focused on the role of the Indonesian Air Force in natural disaster management.

Last book by BNPB (2012) entitled "Tanggap Tangkas Tangguh Menghadapi Bencana" (BNPB, 2012), contains knowledge and information about disaster in order to realise the concept of disaster risk reduction and to minimise casualties from disasters that never come. With this book, it is hoped that the Indonesian people will always be ready and resilient in facing disasters. This text is in line with the

BNPB's article on disaster management but has some differences in the subject.

Research Method

This study employs a descriptive analysis method with data collection techniques through library research that is looking for references from book literature, data, regulations, legislations, manual books, journals, and information through other internet and printed media related to the subject matter with this study. Likewise, all the data obtained serves to validate the findings of this study.

Suwaji

Windy Dermawan

Rizki Ananda

Ramadhan

Discussion

During 2018, there were 2,572 disasters occurred and caused 4,814 people died or lost and 10,239,533 others were affected and displaced (BNPB, 2018). The disaster also damaged 320,165 houses around the center of the disaster (BNPB, 2018). The handling in emergency response is very important to evacuate disaster victims to safe areas, as well as provide clothing and food needs for the victims. Meanwhile, the current condition shows that the involvement of the Air Force in handling disasters is still limited in helping on the basis of humanity's call as fellow human-being. In handling with disasters in collaboration with other relevant units, there are no rules or legal law or Standard Operational Procedures (SOP) that govern them. In fact, the Air Force has enormous potential in carrying out air transportation support, both in evacuating disaster victims and sending aid to the affected areas. The Air Force also has personnel who are trained in helping with disaster relief. If the air support operation can be carried out properly and optimally, it will provide the improvement of potential support for the ongoing operation of the disaster management that is happening. To provide optimal support, the Indonesian Air Force needs to conduct intense coordination with other units involved with handling disasters, given the strength of the defense equipment owned by the Air Force is still limited. At present, there is still a lack of synergy between related agencies in disaster management, thus slowing down the disaster management process and ultimately influencing national stability.

Operationally, the Air Force together with disaster management stakeholders have carried out activities both in the pre-disaster, disaster response, and also post-disaster periods. However, the implementation was not optimal because the availability of defense equipment

owned by the Air Force was very limited. The Indonesian Air Force main defense system support in handling natural disasters in Palu is only operating 16 aircraft, consisting of 12 C-130 aircraft, 4 CN295 aircraft, 2 NAS 332, and 1 EC 275. The number of these aircraft is very limited compared to the needs in the disaster area which is used to bring refugees out of Palu and bring volunteers and soldiers to Palu. The condition of the number of flight sorties which greatly exceeds the allocation of flight hours planning for disaster management ultimately reduces the operation and training functions of the Indonesian Air Force that were previously planned, and excessive use of aircraft operations without thinking about compensation for maintenance can negatively impact flight and work safety.

During the disaster response, the realities that occur in the field are the lack of proper coordination and synergy implementation between all stakeholders. The coordination between related stakeholders are not fast enough in carrying out their duties, functions and authorities. The coordination mechanism and procedure process has not been organized because the application of the principles of coordination, integration and synchronization by the relevant units has not been optimal yet to make it effective and efficient. The Indonesian Air Force must have accountability in dealing with casualties and property as well as damage to infrastructure and regional infrastructure, controlling humanitarian assistance from the government, community members and abroad, carrying out assistance and service to the disaster affected communities, structuring the mobility of logistics distribution, health assistance and evacuation to implementing coordination unit (Satkorlak) and coordination unit (Satlak) by the land and air.

At the time of the response, the synergy between the Air Force and BNPB had not synergized as expected. The BNPB as the operational coordinator still uses commercial flights as a means of air transportation to transport logistics and personnel. The use of Indonesian Air Force aircraft only did right after the disaster occurs during the initial survey, mapping and assessment of natural disasters. However, the lack of coordination and communication shortly after the disaster made it hard to decide the transportation and evacuation routes and caused the process is hampered. In addition, the synergy between the Air Force and PMI has not been well encompassed. Cooperation system between the two parties has not been established yet. The use of Air Force to run the air transport without the basis of a cooperation agree-

ment resulted in a messy flight schedule of the Indonesian Air Force. Besides, regarding the synergy between the Indonesian Air Force and the Ministry of Social Affairs, it has been well established; although it needs to be improved considering that the Ministry of Social Affairs does not have the main tools in sending aids and logistics. At present there is no legal law between the Air Force and the Ministry of Social Affairs in handling disasters. The absence of a legal law of cooperation also occurs between the Air Force with the BMKG and the Air Force with the Ministry of Public Works and Public Relations which inhibits the optimisation of synergy between the parties involved.

In addition to problems in synergy with other institutions due to the absence of a legal umbrella, the Indonesian Air Force also faces other problems in disaster management such as the lack of defense equipment in handling disasters; there is no organisation in the Air Force that specifically handles disasters, and incomplete software involving the Air Force in disaster management. The involvement of the Air Force in disaster management also give implications for the disruption of the implementation of the OMSP and the TNI's tasks, whereas if efforts to improve the implementation of the OMSP in disaster management are not optimally supported, the efforts to realise the main tasks of TNI will also be hampered.

One of the most important factors that must be considered as a reference in making decisions and determining policies is the development of a strategic environment that will affect the stability of a country's security. Indonesia must always pay close attention to the development of global, regional and national situations, especially the aspects that can affect the conditions of stability in the country so that all decisions and policies are implemented properly. As seen from the development of the national situation, the Indonesian Air Force as one of the main components of Indonesia's defense must be able and willing to be the driving force for change in a better direction to help create a stable national stability. Natural disasters that lately often happen in Indonesia demanded the readiness of the Indonesian Air Force to support disaster management in accordance with the main duties of the TNI in the OMSP.

The impact of the development of the strategic environment is to create various opportunities and challenges in the effort to increase the involvement of the Indonesian Air Force in handling natural disasters in order to implement OMSP. Opportunities, that can be utilised by

Indonesia, include: aspects of the global environment where the state needs to realise that the Air Force has a significant role in fulfilling logistics and disaster response. Therefore, the need for completeness of defense equipment must be a priority. Meanwhile, on the national aspect, Indonesia's strategic geographical location and increasing population growth as well as political, economic, social, cultural, scientific and defense dynamics open opportunities for the Indonesian Air Force to increase its role in the deployment of personnel and defense equipment owned. The need for the presence of the Air Force on all fronts in the national arena can provide opportunities to accelerate the fulfillment of needs and increase the readiness of the Indonesian Air Force defense equipment. In addition to opportunities, there are some obstacles. They include the potential for natural disasters of a global nature due to weather anomalies, global warming and careless and irresponsible human actions in exploiting natural resources that can threaten the lives of the global community, including Indonesian citizens. Another obstacle is the national condition which up until now is not yet stable due to social conflicts, political problems, economic problems, as well as the actions that lead to the disintegration of the nation, resulting in conditions of national stability being disrupted. This situation causes obstacles in the preparation of the Air Force defense equipment so that impacted to the lack of optimal role and tasks of the Air Force in implementing OMSP in natural disaster activities.

Supposedly, the involvement of the Air Force in disaster management has a decisive function, especially in the role of air transportation, medical assistance, and security around the airport as a center for logistics distribution by air. In accordance with the capabilities of the Air Force in terms of speed and carrying capacity, the Air Force has carried out the distribution of foods, medicines, clothes, and volunteer personnel and equipment to the affected areas. This has been carried out by the Air Force in natural disasters in Donggala & Palu. The disaster management in the emergency response is very helpful to reduce the suffering of victims from disasters. The handling in emergency response is very important to evacuate disaster victims to safe areas, as well as provide clothes and food needs for the victims. Therefore, it is hoped that there will be optimal synergy between involved stakeholders in handling disasters. The stakeholders in disaster area related to Air Force task are the BNPB, BNPP, PMI, BMKG, the Ministry of Social Affairs, and the Ministry of PUPR. With the great potential of the Air

Force in carrying out air transport assistance to support the need for logistics and personnel mobilisation carried out by every related unit. It is necessary to establish an SOP so that a network of synergy between the Air Force and stakeholders involved in disaster management is formed.

If a SOP has clearly established, the Air Force will more easily cooperate with stakeholders to mobilize logistics and personnel so that the implementation of air support in the context of disaster management is optimal to maintain national stability. There are several indicators of success that can be used as a reference for comparing conditions before the SOP and the conditions expected from the optimisation of AU involvement after SOP, including: the availability of Indonesian Air Force defense equipment in supporting optimal disaster management according to the needs in the disaster area; the formation of an organisation in the Air Force that is ready in handling disasters; optimal contribution of the involvement of the Air Force in handling disasters by implementing OMSP; the availability of software involving the Indonesian Air Force in handling disasters in line with Government Regulation No. 21/2008 concerning the Implementation of Disaster Management, mentioned several agencies involved in disaster management including the Ministry of Health, the Ministry of Social Affairs, the Ministry of Public Works, the Indonesian National Police, the National SAR Agency and Indonesian National Army (TNI). The Air Force is one of the resources in handling disasters during an emergency response with control by the BNPB or BPBD. Based on the laws and regulations above, it is expected that optimal cooperation will be established with an MOU between the Indonesian Air Force and relevant ministries and institution in handling the impact of natural disasters. The optimal implementation of CSOs will ultimately contribute to the achievement of the TNI's main task, namely to protect the entire nation and the whole of Indonesia's blood spills from threats and disturbances to the integrity of the nation and state, in accordance with the mandate of Law Number 34 of 2004.

After times of consideration to several aspects that are used as a determinant in the implementation of the optimisation of the Air Force's involvement, a policy can be formulated as follows:

“The Realisation of the involvement of the Indonesian Air Force in optimal disaster management through efforts to issue regulations on the implementation of the Air Force's air

Suwaji

Windy Dermawan

Rizki Ananda

Ramadhan

support and harmonize the Standard Operational Procedure (SOP) for emergency response, increase the capability and strength of the Indonesian Air Force defense system, realise positive synergy by arranging operational cooperation/ MOU between the Air Force with all stakeholders, establishes a permanent unit for disaster management within the Air Force organisational structure and establishes a contingency budget allocation for the Air Force that is sufficient to carry out the OMSP in order to support the TNI's main tasks.”

The policy needs to be implemented through a number of strategies taking to consider the opportunities and constraints faced in implementing CSOs in order to support the TNI's main tasks. The strategic options proposed by researchers including:

- a. The first strategy is to create positive synergy by issuing Implementing Regulations Regarding Air Force Air Support in Disaster Management, Arranging Operational Cooperation/ MOU between the Air Force and all stakeholders, and harmonising the Standard Operational Procedure (SOP) for Disaster Emergency Response. The Method that can be used including coordination, assessment, FGD, revision, determination and socializing.
- b. The second strategy is to improve the capabilities and strength of the Indonesian Air Force's defense equipment in handling disasters. The means used to realise this strategy are the Ministry of Defense and Mabesau with the method of assessment, submission, procurement and cooperation.
- c. The Third Strategy is to establish a permanent unit for disaster management in the Air Force's organisational structure and to determine a sufficient contingency budget allocation for the Air Force. The means used to realise this strategy are the Ministry of Defense and Mabesau with the assessment method, and the submission of organisational validation.

Conclusion

This study discusses the optimisation of the involvement of the Air Force in handling disasters in order to carry out OMSP in order to support the main tasks of the TNI. In the implementation of disaster management by the government, the Air Force has a vital role. This role requires the support of various stakeholders and all components of the nation. Issues that have arisen related to disaster management

so far have not been well synergize between ministries/ institutions and the Air Force, the limited defense equipment and the absence of permanent organisations within the Air Force that specifically handle disaster issues. To handle it, there are three strategies to overcome the problem of the involvement of the Indonesian Air Force in disaster management. The first one is by creating positive synergy in issuing implementing regulations related to the Air Force's air support in disaster management. The second one is arranging operational cooperation/ MOUs between the Air Force and all stakeholders. The third one is harmonising Standard Operational Procedure (SOP) disaster response, increasing the capability and strength of the Indonesian Air Force's defense equipment in handling disasters, and finally realise the establishment of a permanent unit for disaster management within the Air Force's organisational structure and determine the contingency budget allocation for the Air Force that is adequate.



SUWAJI, WINDY DERMAWAN and RIZKI ANANDA RAMADHAN are affiliated with the Universitas Padjadjaran, Bandung, Indonesia. The authors can be contacted at suwajisiswoyo76@gmail.com.

References

- Anwar, H. Z., & Harjono, H. (2013). *Menggapai Cita-cita Masyarakat Tangguh Bencana Alam di Indonesia*. Andira & Lipi: Jakarta.
- Bertalanffy, L. V. (1968). *General System Theory: Foundations, Development, Applications*. George Braziller, Inc.: New York.
- BNPB. (2012). *Buku Saku Tanggap Tangkas Tangguh Menghadapi Bencana*. Jakarta: BNPB.
- BNPB. (2018). *Info Bencana Desember 2018*. Retrieved from <https://bnpb.go.id/uploads/24/info-bencana-desember-2018.pdf>.
- Covey, S. R. (1989). *The 7 Habits of Highly Effective People*. Free Press: Miami.
- Gomez, O. A. & Gasper, D. (2013). *Human Security: A Thematic Guidance Note for Regional and National Human Development Report Teams*. UNDP Human Development Report Office.
- Haryono, K., Mastra, IGP., Suryaningsih, L., & Inspektorat Jenderal Departemen Koperasi Indonesia. (2010). *Optimalisasi Operasi Angkutan Udara TNI AU dalam Penanggulangan Bencana Alam pada Masa Mendatang*.
- Huston, J. W. (2002). *American Airpower Comes of Ages: General Henry H. "Hap" Arnold's World War II Diaries*. Air University Press: Alabama.
- Indonesia Investments. (2018). *Natural Disasters in Indonesia*. Retrieved from <https://www.indonesia-investments.com/business/risks/natural-disasters/item243>.

CEJISS
4/2019

- Nugroho, S. P. (2018). *Percepatan Pemulihan Dampak Bencana Terus Diintensifkan di Sulteng* Badan Nasional Penanggulangan Bencana.
- Stoner, J. A. F. & Charles Wankel (1986). *Management (third edition)*. Prentice Hall International Inc: London.
- World Health Organisation Indonesia. (2018). *Situation Report #01 Sulawesi Earthquake and Tsunami, Indonesia*. Retrieved from https://www.un.or.id/component/bdthemes_shortcodes/?view=download&id=of26b8dacc30b7cccf5b70687a9117.