

CHALLENGES IN THE DISTRIBUTION OF HUMANITARIAN LOGISTICS FOR THE NATURAL DISASTER IN PALU 2018

Irna Dewi^{1*}, Kamilia Nazihah Khairunnisa², Euis Saribanon³, Paul Sipoh Hutaeruk⁴

^{1,2,3,4} Institut Transportasi dan Logistik Trisakti, Jakarta, Indonesia

*Corresponding author: idewi1711@gmail.com

Abstract: The logistics process is used for humanitarian operations in the humanitarian logistics. This research shows how important the humanitarian logistics is and how it needs to be considered by all parties. The location of Indonesia which is on the equator allows the meeting of the two plates of the Mediterranean and the Pacific which causes frequent earthquakes and volcanic eruptions, and even tsunami. Indonesia, which has often experienced natural disasters, is still experiencing difficulties in the process of preparing for and handling them. The earthquake in Palu Indonesia on October 28, 2018 has left 2.073 people killed, 10.679 seriously injured, 8.130 lightly injured, and 680 missing. This disaster management process took place from 28 October 2018 to 26 September 2018. This event also shocked the world and taught every country to be better prepared for future emergencies. This research was conducted qualitatively through literature related to published material, analyzing official journals, and conducting direct interviews. From the analysis of secondary data, it was found that the study of humanitarian logistics is still an area that needs to be improved from time to time. It is also a very important area of research that requires attention and support from society, organizations, and governments.

Keywords: Humanitarian logistics, natural disaster, challenge, BNPB, WFP

1. Introduction

Many of us already know about logistics in commercial supply chains, but not many people realize that logistics is also an important tool in humanitarian disaster management activities. According to (Rikadoraya et al., 2020), Indonesia in terms of its geological and geographical structure, is an area that is disaster-prone, such as for natural disasters such as landslides, earthquakes, floods, volcanic eruptions, forest and land fires, tsunamis, hurricanes, as well as non-natural disasters such as technological failures, failed modernization, and epidemics. The government has established the National Disaster Management Agency (BNPB) at the national level and the Regional Disaster Management Agency (BPBD) at the regional level as disaster management institutions.

According to the Meteorology, Climatology and Geophysics Agency (BMKG), Indonesia is one of the countries that has the highest frequency of earthquakes in the world because it is located in a very active seismic zone. However, the vast territory of Indonesia makes not all earthquakes have a direct impact or can be felt on the mainland. In October 2018 in Central Sulawesi natural disasters occurred

in the form of an earthquake, tsunami, and liquefaction, causing many residents take refuge in refugee camps as shown in figure 1.



Figure 1. Evacuation Location

Source: <https://www.bbc.com/indonesia/indonesia-45729112>

Liquefaction is soil that suddenly changes like quicksand. The areas that experience liquefaction are the Balaroa housing complex and Petobo Village. BNPB stated that Balaroa, Jono Oge, and Petobo are areas that are in the world's spotlight because they are considered lost areas due to the earthquake and tsunami as stated by (Fadlurrahman et al., 2020).

According to (Nugroho, 2018) observations in the field show that infrastructure such as buildings and roads are damaged so that it is dangerous to pass. The period time for the tsunami to reach the coastline of Palu Bay was 17.10-17.13 WIB / 18.10-18.13 WITA, and the height range was 0.5-3 meters. The height of the tsunami along the shoreline differs depending on the depth of the seabed approaching the coast or also known as bathymetry. Almost all buildings on the coast were badly damaged by the earthquake and followed by the tsunami. Figure 2 is a map of the location of the disaster points that occurred in 2018 in South Sulawesi Province according to the Meteorology, Climatology and Geophysics Agency (BMKG).



Figure 2. Earthquake Point

Source: <https://www.bmkg.go.id/berita/?p=gempabumi-tektunik-m4-8-mengguncang-provinsi-sulawesi-tengah-22-september-2018-tidak-berpotensi-tsunami&lang=ID&tag=press-release>

Palu is one of the cities that suffered the most damage than other cities in Central Sulawesi where the impacts were both direct and indirect. In reality, humanitarian logistics is much more complicated and detailed than commercial logistics which includes resource optimization, inventory processing, and information exchange from point of origin to point of destination. The role of logistics in humanitarian assistance is very important, especially during pre-disaster and post-disaster. Preparedness and rapid response are very important in humanitarian logistics to ensure that the 7 items are correct, namely: the right type of aid goods, right on target, right quality, right quantity, right cost, right reporting and timely according to (Bastuti et al., 2019).

According to Khambali (2017), higher efforts in logistics activities to deal with natural disasters that often occur are urgently needed in Indonesia. Natural disasters require excellent knowledge and fast response. Knowing how to handle costs from various logistics institutions is also very necessary.

Humanitarian logistics are fundamentally different from commercial logistics processes in that they aim to provide humanitarian support in the form of medicine, water, food and shelter. Humanitarian logistics also focuses on responding to search and rescue, maintaining or saving lives, and restoring self-sufficiency. These operations are always hampered by logistical problems,

difficulties in humanitarian logistics management, disaster management policies, and excessive financial resources as stated by Khambali (2017).

As explained by the United Nation Joint Logistics Center (2008), during humanitarian logistics, the processes required are: (1) Providing supplies of goods in accordance with good conditions, (2) Coordination and prioritizing the use of limited and shared transportation, (3) Storing, managing, and moving bulk commodities, (4) Moving people, (5) Special deliveries from outside the affected area.

1.1 Definition of Disaster

According to Parker (Bastuti et al., 2019), a disaster is an event that occurs due to nature itself and human actions, for example: a side effect of excessive use of technology in an environment. Meanwhile, according to Khambali (2017), disasters are a consequence of various activities such as landslides, floods, tornadoes, volcanic eruptions, tsunamis, earthquakes, etc.

1.2 Definition of Logistics Management

Siahaya (2012) defines logistics management as part of the supply chain that plans, implements and controls the flow of goods efficiently and very effectively, including transportation, storage, distribution, and services as well as information from the place of origin of goods to the place of consumption for meet customer needs.

Meanwhile, according to Dwiantara and Hadi (2005), logistics management is a series of planning, organizing, and supervising activities for procurement, recording, distribution, storage, maintenance, and elimination of logistics to support effectiveness and efficiency in achieving organizational goals

1.3 Definition of Humanitarian Logistics

Humanitarian logistics is the management of aid where there is a humanitarian emergency. This humanitarian logistics has the principles of efficiency and effectiveness in the distribution of disaster aid distribution, from the point of providing assistance or origin to recipients of assistance (Chandes and Pache, 2010).

2. Research Method

2.1 Study

This research was conducted based on journals, articles, and news to obtain secondary data and opinions from direct interviews with one of the WFP (World Food Program) Indonesia parties to find out the policies and systems provided during the 2018 Palu natural disaster management and the researchers also interviewed Hadiano Wardjuman in BNPB (National Disaster Management Agency) of the Republic of Indonesia to find out the challenges in distributing the needs for natural disaster assistance faced in Palu on September 28, 2018.

2.2 Data Types and Sources

The research method used in this study is qualitative method to obtain in-depth descriptive data such as interviews and observations (Poerwandari (2005)). This research focuses on the challenges faced in humanitarian logistics processes. The qualitative method is one type of research that focuses on in-depth observations so as to provide more comprehensive results.

The selection of informants was carried out using the purposive sampling technique, meaning that the selected informants were people who knew the problem well and clearly so that they could provide good and correct information data.

2.3 Method of collecting data

Data was collected using an in-depth interview method with the Disaster Management Agency and representatives of the United Nations Jakarta staff. Interviews were conducted between the interviewee and the skilled interviewer, which was characterized by in-depth exploration and the use of open-ended questions.

2.4 Population and Research Sample

Because the situation in this study focuses on observing activities, people (actors), and certain places (places) which will become a continuity of discussion (Sugiyono, 2008, 49). So that the social situation taken by the researcher was the distribution of aid goods in humanitarian logistics in Palu, Central Sulawesi on September 28, 2018. The research samples in the form of journals were taken

through Google Scholar, Google Books, the journals that the researchers used to analyze 7 journals, 3 books, and BBC online newspaper on the distribution process of logistical assistance in disaster areas.

2.5 Data analysis tools

The data analysis technique used in this research is to use journals related to humanitarian logistics, logistics books and data results from conducting interviews to certain sources. The main purpose of the qualitative approach is to develop understanding, concepts so that they can become a theory. This stage is also known as "grounded theory research" according to (Qualitative Research Methodology, Rukin, 2019), especially the discussion of case studies in the hammer in a journal that is currently in progress that we discussed.

3. Results and Discussion

3.1 Fundamentals of Humanitarian Logistics Process

Hadianto Wardjaman of BNPB of the Republic of Indonesia in an interview conducted by researchers said that the role of humanitarian logistics in the Palu disaster was more focused on meeting logistical needs that were disrupted or could not be fulfilled due to liquefaction, tsunami and tsunami disasters. Hadianto also added that the types of aid that could be distributed in the Palu disaster were logistics for survival, ranging from electricity, clean water, food, medicine, tents, blankets to baby diapers and sanitary napkins.

Meanwhile, Hadianto also explained that the coordination mechanism for the types of wet and dry logistical assistance for disaster victims in Palu was adjusted based on the results of rapid assessments or assessments in the field. Determination of needs, resilience expired logistics storage or mobilization capabilities need to be considered.



Figure 3. International Assistance

Source: <https://www.bbc.com/indonesia/indonesia-45702371>

Ikhsanuddin Adam as the Logistics Officer at WFP (World Food Program) added in interviews that researchers have conducted that humanitarian logistics is also an unpredictable demanding situation. It means that the demand for the needs cannot be easily predicted like commercial logistics in general. Therefore, historical data from each natural disaster area is needed as a reference for distribution and planning. An example is if there is a tsunami or earthquake that occurs, social institutions will be able to more easily cope and plan policies quickly and briefly to see how natural disasters are handled in the area.

Ikhsanuddin Adam also added that in an emergency, after knowing the alert signal, they will usually use a push system: shifting the general need for assistance from upstream to downstream. During the push strategy and the assistance is sent they will send a team to do research and study in-depth quickly and precisely to find out what needs are needed in general such as medicines, clothes, etc. Then a pull strategy will be applied to control aid as needed per region. The last step is to examine more specifically the groups of people who have dependence, such as disabilities, pregnant women, and babies who need milk or the distribution of tents to each head of the family.

In building emergency logistics in a short time, Hadianito said that BNPB runs a good mechanism and coordination through the national platform as well as the cooperation of ministries and institutions coordinated within BNPB. In handling emergency logistics, the party who will assist is given one door access through BNPB which is transported *en masse* or using other logistics that have been provided through disaster organization volunteers by informing the availability of

logistics to BNPB so that there is no duplication of aid provision and logistics can be divided evenly.

(Maulidiah et al., 2019) stated in the policy set by BNPB that the distribution of logistical assistance to disaster-affected residents was carried out two weeks after the assessment or data collection process for areas and residents affected by disasters was carried out by private social institutions. This is due to road conditions and some emergency facilities that are not yet conducive. The distribution route that is carried out is only to send packages from the coordination post to another service post. There are no specific procedures and strategies in the distribution process.

Meanwhile according to Hadiano, the BNPB itself carried out the process of distributing aid starting on the second day for preparations for the mobilization of goods and the next day for delivery to locations that were easy to reach and to locations that were difficult to reach.

3.2 Role of Parties Involved in Humanitarian Logistics

In the Distribution of Humanitarian Logistics, there is a concept or system, namely Strengthening the Cluster System: to coordinate the handling of natural disasters in an integrated manner to carry out relief operations by providing a more detailed division of tasks to all logistics stakeholders in Indonesia or across sectors who work together to assist. can be accepted evenly and can be accepted according to what is needed (Arif, 2021).

Hadiano Wardjaman said that the parties involved in distributing relief assistance range from the government and non-government, such as disaster management partners to the private sector, Non-Governmental Organizations (NGOs), and the business sector.

Therefore, the researchers argue that anyone is allowed to carry out relief operations from both private organizations and state agencies because this is humanitarian which saves human lives in the shortest possible time at any time, so humanitarian logistics do not judge an operation in terms of its profitability.

All actors have important responsibilities and duties to ensure that humanitarian logistics plans can run well. The government is tasked with handling the movement of humanitarian logistics, they have the power to authorize operations and mobilize available resources according to the research analysis according to (Daswati et al., 2019).

3.3 Humanitarian Challenges Logistics Natural Disasters in Palu

The challenges that were faced during the natural disaster case in Palu were very complex in terms of infrastructure. This is because the location of the disaster is in the capital city of Sulawesi province, where all economic centers are located. One example is Mutiara SIS Al-Jufrie Airport. As explained by Hadian Wardjuman from BNPB, the challenge felt by BNPB was accessing and landing for aircraft to enter Palu. This also had some implications for logistics supply, both within the city and the supply of goods and services that go to the surrounding district.

Damage to warehousing infrastructure coupled with massive looting from community elements in logistics supply warehouses also resulted in goods that should have been distributed either to cities or regencies, in the end, could not be carried out properly and correctly. According to (Samad et al., 2020), the logistics parties had to buy the availability of resources from Makassar or other nearby areas.



Figure 4. Broken Infrastructure

Source :

https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.bbc.com%2Findonesia%2Findonesia-45832237&psig=AOvVaw1OnYlfJiaoXy0_fNOS-CHG&ust=1628955419448000&source=images&cd=vfe&ved=2ahUKEwio66j6qa7yAhVj1nMBHd8-AK4Qr4kDegQIARBP

Meanwhile, from the aspect of facilities, Indonesian Red Cross (PMI) also said that the obstacle experienced in the distribution of logistical assistance was the difficulty of renting a vehicle for distribution using land routes. PMI said that there were still many earthquake locations in Palu that had not been touched by aid. There were still many isolated areas which made the distribution of aid was not even.

Researchers and informants from the WFP (World Food Program) also saw that road access was cut off and infrastructure damage was one of the reasons for the difficulty in distributing aid goods. Therefore, the researchers assume that if there was a broken road, then they could look for other alternative routes or use transportation other than land. However, in this case, if the natural disaster experienced is slow on-set, which comes slowly and can be predicted in advance, then there is no need to use air transportation because it can carry out the evacuation stages first or minimize disaster victims and carry out another appropriate handling. more needed.

(Kristiyono et al., 2021) also emphasized that when the earthquake and tsunami occurred in Palu, West Sulawesi in 2018, Pushidrosal (the City of Naval Development which is directly under the Chief of Naval Staff) sent an Immediate Response Unit Team. This team was tasked with taking bathymetric data around the port and shipping lanes to the port and checking whether the pier can still be used. This task was an effort to guarantee shipping security in the delivery of humanitarian aid by sea.

When viewed from the aspect of social communication, according to the researchers, the government in the field of disaster was still not ready to face the events that occur. When a disaster occurs, there is a lot of inappropriate coordination in the delivery of information from the data obtained by the government to the logistics assistance party.

The same thing is also explained by (Daswati et al., 2019), where the local government has not provided valid information regarding the number of victims

after the disaster. In the end, the distribution of logistics and assistance from humanitarian agencies was not spread evenly. There was even the case of Wani Village in Palu where the original inhabitants of the village were not registered by the local government authorities as one of the victims of the disaster. In the end, the family did not get the right to occupy one of the temporary shelters built by humanitarian agencies in the village. Hadiano Wardjaman also said the same thing, where everyone had to attach an Identity Card or Family Card, while many of them were damaged and even lost legal documents during the disaster.

The social aspect of disaster management was also emphasized by (Arif, 2021). During an emergency, the provision of communication services is very important in the success of the process of handling residents affected by natural disasters or conflicts in an area. The researchers also consider that the Emergency Communication Service plays a role in supporting the process of sending aid and ensuring that the affected community can access information, receive assistance, contact closest relatives and make decisions based on the information received.

According to Zaldy Ilham Masita, General Chair of ALI (Indonesian Logistics Association), it is not only road access that is a challenge in humanitarian logistics. However, the existing distribution channels are difficult to establish because of the lack of coordination between the field officers on duty on the first day of the earthquake and tsunami is one of them. An important point in handling an emergency disaster should be to trust one command regarding the distribution of goods, but the implementation in the field is that there are many different instructions and do not refer to the BNPB by officers which cause the distribution of logistical aid distribution to be not smooth in Palu.

To face the challenges so that information on aid and distribution of goods can be received and distributed to disaster victims, BNPB has created one-door access for humanitarian logistics. In an interview conducted by Hadiano Rasyid, BNPB made a warehouse to centralize all aid and made a mapping of aid distribution to optimize distribution received and distributed to disaster victims. By using population/refugee data, the types of needs needed, the involvement of local authorities starting from the smallest RT to the sub-district. It is hoped that the

distribution can be delivered to disaster victims. BNPB also collects online information to record humanitarian actions and forms of humanity so that logistics distribution can be spread evenly.

4. Conclusion

It can be concluded from the data analysis and interviews that have been conducted that the humanitarian logistics process is still an operation that needs to be researched and improved every day. It is also a very important area of research that requires attention and support from people, organizations, and governments. Humanitarian logistics has the opportunity to increase its contribution to disaster management by improving knowledge management, technology, measurement, community, and voice. While the delivery of aid to disaster areas will continue to play an important role in logistics, timely provision of information means that information used to gather insights and learn from others should be a strategic priority.

5. References

- Abdulkarim, S., Babaji, N. A., & Isa, A. M. (2021). *The Relationship Between Humanitarian Logistics Management and Disaster Management In North- Eastern Nigeria*. 04. Retrieved June 8, 2021 from <https://bit.ly/humanitarianlogisticsinnigeria>
- Ahdiah, I. (2019). Dinamika Penyintas Menjadi Relawan (Studi Kasus Pada Organisasi MDMC Dalam Menangani Bencana Gempa, Tsunami Dan Likuefaksi Di Kota Palu). *Jurnal Dialektika*, 4(1), 34–44. Retrieved August 10, 2021 from <https://bit.ly/Dinamikamenjadirelawangempabumipalu>
- Arif, M. (2021). Peran World Food Programme Dalam Menangani Korban Bencana Angin Topan Haiyan Di Filipina. *Jurnal Hubungan Internasional*, 9(1), 47–59. Retrieved July 27, 2021 from [https://ejournal.hi.fisip-unmul.ac.id/site/wp-content/uploads/2021/03/Jurnal%20Muhammad%20Arif%201302045093%20\(47-59\)%20\(03-01-21-01-45-47\).pdf](https://ejournal.hi.fisip-unmul.ac.id/site/wp-content/uploads/2021/03/Jurnal%20Muhammad%20Arif%201302045093%20(47-59)%20(03-01-21-01-45-47).pdf)
- Jaya, A., Nishikawa, O., & Jumadil, S. (2019). Distribution and morphology of the surface ruptures of the 2018 Donggala–Palu earthquake, Central Sulawesi, Indonesia. *Earth, Planets and Space*, 71(1). Retrieved August 1, 2021 from <https://doi.org/10.1186/s40623-019-1126-3>

- Kurniadi, Y U., et al. (2020). Nusantara (Jurnal Ilmu Pengetahuan Sosial). *Nusantara: Jurnal Ilmu Pengetahuan Sosial*, 7(2), 408–420. Retrieved August 1, 2021 from <https://link.springer.com/article/10.1186/s40623-019-1126-3>
- Kobayashi, T., Khojasteh, Y., & Kainuma, Y. (2019). Analysis of multi-objective decision problems in humanitarian supply chain. *Operations and Supply Chain Management*, 12(2), 60–67. Retrieved 30 July, 2021 from <https://doi.org/10.31387/oscm0370223>
- Maulidiah, M., Jono, J., & Ramli, I. R. (2019). Penentuan Rute Penyaluran Bantuan Bencana Guna Meminimalkan Biaya Distribusi Dengan Metode Saving Matriks. *Jurnal Rekayasa Industri (Jri)*, 1(1). Retrieved August 1, 2021 from <https://ejournal.widyamataram.ac.id/index.php/JRI/article/viewFile/57/46>
- Nugroho, S. P. (2018). Penanganan Bencana Gempabumi M7,4 dan Tsunami di Sulawesi Tengah. Bnpb. Retrieved July 30, 2021 from https://bpbk.karanganyarkab.go.id/wp-content/uploads/2018/10/2018_10_11_Penanganan_gempa_tsunami_Sulawesi.pdf
- Peter Tatham, Martin Christopher, P.T. (2018). Humanitarian Logistics: Meeting the challenge of preparing for and responding to disasters. Vol 3. London, United Kingdom (Third Edition).
- Rukin (2019). Metodologi Penelitian Kualitatif. Takalar: Yayasan Ahmar Cendekia. Cetakan Pertama. Hlm 18.
- Subiyakto, S., Komando, D. A. N., Angkatan, T. N. I., & Jakarta, L. (2021). *THE INDONESIAN NAVY HYDRO-OCEANOGRAPHIC CENTRE REAL ROLE*. Hlm 198-2014. Retrieved August 1, 2021 from <https://bit.ly/TemuanPraktisAsistensiKlasterPengungsianDanPerlindunganDalamPenangananDaruratBencanaGempaBumiTsamipalu>