

Evaluation of Aid Needs Fulfillment System Involving the Private Sector (PT. Jupiter Logistics) for Natural Disasters: Case Study of the 2022 Cianjur Earthquake

Osman Arofat^a, Suprihadi^a, Febry Dwiyanasyah^a, Nadin Alfaneanda^a

^aFaculty of Management and Business, Institut Transportasi dan Logistik Trisakti,
Jakarta, Indonesia

Corresponding author: arofat812@gmail.com

Abstract: This study aims to evaluate the fulfillment of disaster relief by aid agencies in Indonesia. Aid can be pooled and distributed by governments, private companies, and communities. Logistical support must arrive on time in the right location, target oriented, good quality, enough quantity, and needed. This research used interview methods with BPBD, PMI, and the private sector and distributed questionnaires to 101 respondents to identify community involvement in the current disaster management system. The result of this research shows that the fulfillment of goods through disaster management system in the private sector and community need to be improved. The current system is considered less troublesome and has gained the trust of the community. The private sector hasn't been involved enough in this system, even though the private sector is the party that can help existing humanitarian organizations to meet their needs. One of the private parties that can be involved is PT. Jupiter Logistik Indonesia.

Keywords: *Humanitarian Logistic, Fulfillment System, Private Sector*

1. Introduction

Indonesia is a country located in a disaster-prone area. Disaster vulnerability is characterized by the large number of disasters that occur, such as earthquakes, tsunamis, volcanic eruptions, floods, and landslides. Logistical assistance is needed when a disaster occurs. Based on data from the National Disaster Management Agency (BNPB), it shows that the most frequent disasters in 2022 are floods, namely 1,524 incidents, this number is equivalent to 43.1% of the total national disaster events. Apart from that, there were also 1,062 extreme weather events, 634 landslides, 252 forest and land fires, 28 earthquakes, 26 tidal waves/abrasion, and 4 drought events. (Setiawan, Arubusman, & Abidin, 2023). One of the challenges of humanitarian logistics in Indonesia because it is an archipelago country that has 17,504 islands that are inhabited or not which are scattered around the Equator which provide tropical weather to the country of Indonesia. Indonesia is flanked by two continents and two oceans. Indonesia stretches 3977 miles between two oceans, the Pacific and Indian. The land area of Indonesia is 1,922,570 square km and the sea area is 3,257,483 km². (Hidayat, Marina, Agusinta, Setyawati, & Rahmawati, 2019). A humanitarian aid organization is responsible for ensuring donations reach the beneficiaries. Therefore, it is important to design a plan and execute it appropriately. A good plan in procuring aid can reduce the negative impact of oversupply, stock outs and expiry of goods, which also have an impact on time savings and cost reduction. Apart from that, this is seen as an effort to accelerate disaster management in saving human lives and can offer accountability to donors and society in general. (Rikasoraya, Purwoko, Firdaus, & Alfaridy, 2020)

The institutions involved in disaster management in Indonesia are the National Disaster Management Agency (BNPB), Government Social Services, Government Health

Services, and the Indonesian Red Cross (PMI). The results of previous research show that currently, the government itself is still experiencing several obstacles in meeting the need for aid goods. These obstacles include the type of aid that comes not being by the needs of the victims, the amount of aid that comes is not well coordinated so that distribution is uneven, and sometimes the aid that is collected is too much so that it is damaged if it is stored for too long. An example is when a disaster occurred in Cianjur (2022 Cianjur earthquake). The distribution of aid in Cianjur Regency is uneven, but the amount of aid in other areas of Cianjur Regency is quite excessive. This uneven distribution is due to a lack of coordination between aid agencies assisting in the area and the difficulty of access to several locations. This research aims to evaluate the BPBD and PMI assistance needs fulfillment system, as well as the role of the private sector and the community in current disaster management in helping aid agencies meet the assistance needs of disaster victims. It is hoped that this system evaluation can help disaster management institutions to improve the current system so that it can be more targeted, faster, and easier for people who want to be involved in handling aid.

An earthquake occurred on 21 November 2022, at 13:21:10 WIB (Western Indonesia Time). According to information from the Meteorology, Climatology, and Geophysics Agency (BMKG), an Mw 5.6 earthquake occurred in the Cianjur area, West Java. Based on BMKG data, as of November 22, 2022, 140 aftershocks have been recorded with a magnitude of 1.2-4.2 and an average depth of around 10 km, 5 earthquakes were felt by the local community. The main earthquake (mainshock) Mw 5.6 had an impact and was felt in the city of Cianjur with an intensity scale of V-VI MMI (Modified Mercalli Intensity); Garut and Sukabumi IV-V MMI; Cimahi, Lembang, Bandung City, Cikalong Wetan, Rangkasbitung, Bogor and Bayah with an intensity scale of III MMI; South Tangerang, Jakarta, and Depok with an intensity scale of II-III MMI. According to temporary information from BNPB as of November 22 2022 at 17.00 WIB, this earthquake caused 268 fatalities and more than 2,000 houses were damaged. Active Fault Working Group and Earthquake Catalog of the Agency for Meteorology, Climatology, and Geophysics (BMKG). (Supendi, 2022)

PT. Jupiter Logistic Indonesia is a provider of logistics services in Indonesia. PT. Jupiter Logistics Indonesia has developed a strong reputation in the logistics industry with a commitment to always provide the best service professionally. PT. Jupiter Logistic already expanded its service to 37 cities throughout Indonesia, This positive development make it easier to help the government spread the logistic all around Indonesia. (Company Profile PT. Jupiter Logistics Indonesia)

The aim of this study is to evaluate the aid fulfillment system involving the private sector. Researchers seek to determine the extent of the private sector's role in assisting the government in meeting aid requirements during natural disasters. This research focuses on the case study of the Cianjur Earthquake that occurred in 2022, examining how the private sector (PT. Jupiter Logistik Indonesia) contributed to the government's efforts.

2. Literature review

2.1 Humanitarian Logistic

Logistics that handle humanitarian aid are often called humanitarian logistics. Different from commercial logistics, humanitarian aid logistics faces complex challenges according to the characteristics of disaster conditions. The goal of humanitarian logistics is the distribution of disaster relief and disaster equipment to recipients and locations in a timely manner, with the right type and quantity of humanitarian aid, in good condition or quality, and at an efficient and accountable cost. (Dr. Zaroni, 2017). Raden Didit, et al at his paper said Humanitarian

Logistics or Humanitarian Logistics which means planning activities, implement and control effectively and efficiently the flow and storage of goods and materials to alleviate the suffering of people affected by disasters (Hidayat et al, 2018). According to Cozzolino (2012), in humanitarian disasters, the logistics process is a critical factor to consider. The logistics process in humanitarian disasters involves mobilizing people, resources, skills, and knowledge to assist vulnerable individuals affected by disasters. The logistics process in humanitarian disasters is expected to be fast and accurate because delays in aid delivery, even minor ones, can have significant economic and safety implications for disaster victims. Therefore, this logistics process is a measure used to assess whether disaster relief operations are successful or not. (Wassenhove, 2018)

According to the Head of BNPB Regulation No. 23 of 2014 the types of assistance items needed are food, clothing, shelter, medicine, and medical supplies. Each disaster characteristic has different item requirements, so the government must send the appropriate assistance items for specific disaster characteristics. The types of assistance items according to Head of BNPB Regulation No. 23 of 2014 will be explained in the below.

Logistics categories are arranged based on:

- a. Food : Included in this category are staple foods (rice/sago/corn/sweet potatoes/etc), side dishes, clean water, additional staple foods such as noodles, milk, coffee, tea, and so on.
- b. Clothing : included in this category are personal equipment in the form of clothes, t-shirts and trousers for children and adults, men and women, sarongs, long batik fabric, sleeping bags, towels, blankets, negligees, praying stuff, complete sets of underwear and etc.
- c. Shelter : included in this category are Roll Tents, Mats, Mattresses and so on
- d. Other logistics : Included in this category are medicines and medical devices, body bags, family kitchen equipment and so on.

Logistics packages are arranged based on :

- a. Food Packages: consisting of package of 9 basic ingredients, ready-to-eat food package, side dish package, additional nutrition package/vulnerable groups, additional nutrition package for children/vulnerable groups
- b. Clothing Packages: consisting of family clothing packages (father, mother and 2 children), children's clothing packages (boys and girls aged 6-14 years), toddler clothing packages (boys and girls aged under 5 years)
- c. Shelter Packages: consists of tent rolls, mats, mattresses and others
- d. Others Logistics Packages: consisting of first aid packages, health packages, hygiene packages, body bags and household equipment.

(Peraturan Kepala Badan Nasional Penanggulangan Bencana Nomor 23 , 2014)

2.2 Fulfillment System

Fulfillment of needs is a good or service that can fulfill or satisfy human needs. For example, for someone who feels hungry, they need food as a means of fulfilling their needs. In general, fulfillment is a service that includes a series of fulfillment processes so that mutual satisfaction is achieved. The process occurs starting from the customer ordering goods, sending the goods to the recipient's address, until the goods reach the customer's hands. In certain fulfillment services, the process also includes returning goods from the customer to the seller. From its understanding, it can be seen that fulfillment services have a sizeable contribution in helping to process customer orders. Starting from sorting goods, packaging, to delivery via courier expedition. These three processes are part of the responsibilities and duties of the

fulfillment service. (Ginee, 2023) In disaster management fulfillment system, we can see as picture below.

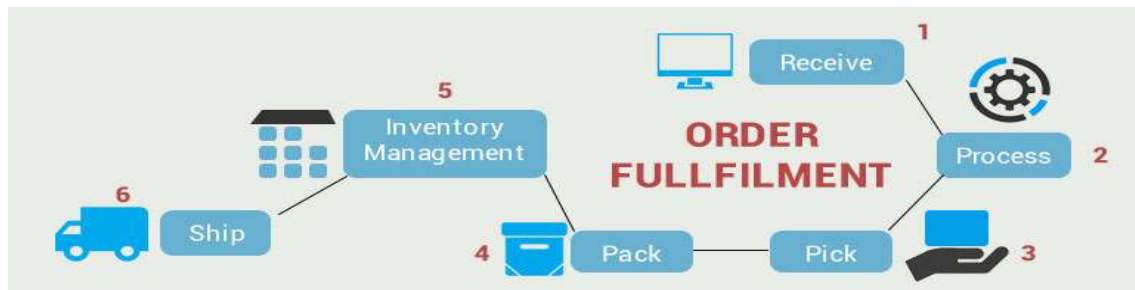


Figure 1

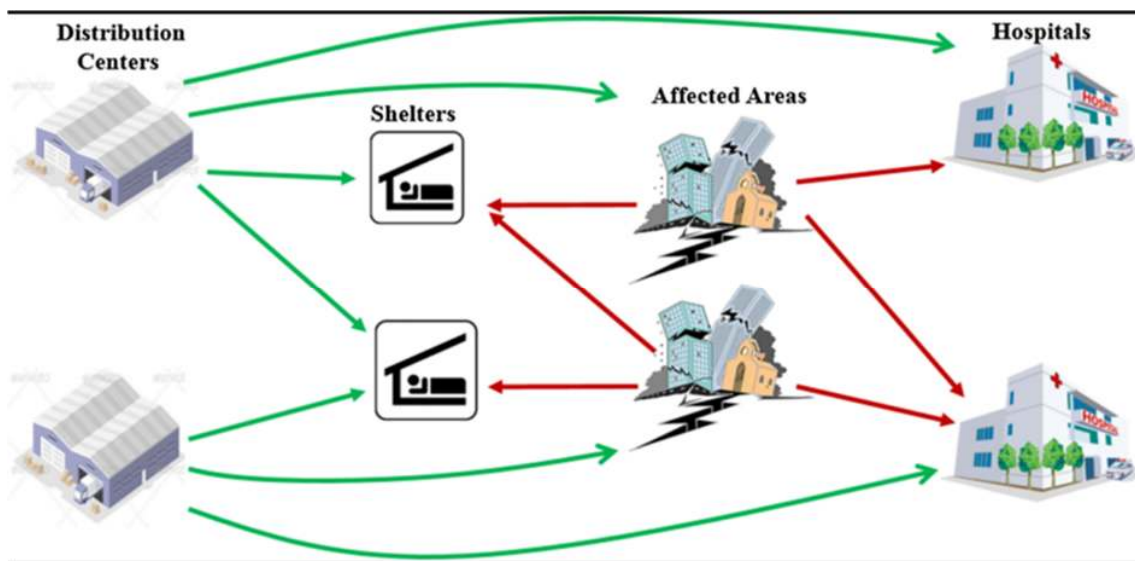


Figure 2

As the picture above, we can explain that once the emergency news arrive, disaster relief team will process (looking more information) about the disaster, and decide what goods need to send away. After that they will pack the goods and manage the warehouse to arrange the shipment to distribution centers. At the distribution center, field team will distribute the relief refers to BNPB regulation. In some of process, we need help from private companies such as PT. Jupiter Logistic Indonesia.

2.3 Private Sector

Cooperation is needed not only among humanitarian agencies but also with other players such as the private sector and local communities. Humanitarian agencies may not have the resources or capabilities to meet unexpected needs that the private sector has. Humanitarian agencies need to work together to ensure risk reduction to victims before they can exit relief operations. The company involved cannot be just one. The government needs to collaborate with several private companies so that meeting the needs of disaster victims becomes easier. One form of cooperation with the private sector that can be carried out is by collaborating with

retail companies (to facilitate the procurement of clothing, food and boards as well as medicines) and logistics (to facilitate transportation services for goods delivery). (Ishiwatari, 2015)

3. Research method

This research uses a descriptive qualitative method. An interview is a conversation with specific purpose. The conversation was carried out by both parties, namely the interviewer (interviewer) who asks questions from those interviewed (interviewees) provide answers to questions. (Hidayat, Firdaus, & Lesmini, 2017). Researchers used the structured interview method to gain information from BPBD Region Bogor (Mr. Sansan Saputra), PMI (Mr. Faizal Wicaksono), and Private Sector Representative (Mr. Eki Abdul Jabbar from, PT. Jupiter Logistic Indonesia). Moreover, the researcher also did some random observations using Google to find out about the number of people who donated, what form of assistance the community provided, and where the community entrusted their donations. Observations were conducted verbally, by asking the same 3 questions to respondents.

Data Collection Method

In this study, researchers gathered all data through interviews with relevant stakeholders, including BPBD (Regional Disaster Management Agency), PMI (Indonesian Red Cross), and a representative from the private sector (PT. Jupiter Logistics Indonesia). Additionally, the form among their family, colleagues, and PT. Jupiter Logistic employees.

4. Results and discussion

4.1 Natural Disasters in Indonesia

Indonesia is a disaster-prone region. Frequent disasters include floods, volcanic eruptions and earthquakes, which is one of the reasons why relief agencies such as BPBD and PMI have emerged. The disaster management system in Indonesia is regulated in Law No. 24/2007 on disaster management. The BPBD acts as the coordinator in a disaster. The BPBD will coordinate other government agencies to help deal with disasters according to their required roles. The current disaster management system in Indonesia only involves government agencies and a number of NGOs. This makes it difficult for these agencies to meet the needs of disaster victims as humanitarian agencies do not have the resources or ability to meet unforeseen needs like the private sector. Private-owned enterprises are less involved in the current disaster management system even though the private sector has a great ability to fulfill needs when a disaster occurs to facilitate the disaster management process in Indonesia.

4.2 BPBD (Regional Disaster Management Agency)

The West Java Regional Disaster Management Agency (BPBD) is a representative of the National Disaster Management Agency (BNPB). The National Disaster Management Agency (BNPB) is a non-departmental government agency whose function is to coordinate the planning and implementation of disaster management activities. BNPB was established based on Law number 24 of 2007 concerning disaster management. BPBD's current strategy is to collaborate with government institutions and the private sector. The form of cooperation carried out with government agencies is the procurement of goods or services in accordance with the field of the government agency. One example of cooperation is the BPBD with the Health Office in terms of providing medicines, equipment, and medical teams to deal with victims who

need medical treatment. These government agencies must be able to fulfill all requests from BPBD because BPBD is an extension of the regional head. The form of cooperation between BPBD and the private sector is like CSR from several companies. The BPBD will contact the CSR partner if the BPBD finds it difficult to do its job when a disaster occurs to provide assistance. The private sector does not have to fulfill all requests from BPBD. This fulfillment is adjusted to the company's capabilities. Another form of cooperation carried out by BPBD is by conducting tenders followed by several companies.

4.3 PMI (Indonesian Red Cross)

The Indonesian Red Cross (PMI) is a national association organization in Indonesia engaged in the social humanitarian field. PMI's role is to assist the government in the field of social humanitarianism, especially the task of martyrdom as required by the provisions of the Geneva Conventions of 1949 which have been ratified by the government of the Republic of Indonesia in 1958 through Law No. 59. As a legal national association, PMI was established based on Presidential Decree No. 25 of 1950 and confirmed its activities as the only national association organization that carries out the task of martyrdom through Presidential Decree No. 246 of 1963. The main task of the Indonesian Red Cross (PMI) is to assist the Indonesian government in the field of social humanitarianism, especially the tasks of the Red Cross which include: Disaster Relief and Management Preparedness, First Aid Training for Volunteers, Health Services and Community Welfare, Blood Transfusion Services.

PMI has the duty to assist the government in disaster management as stated in Presidential Decree No. 25 of 1950 and Presidential Decree 246/1963. The role of PMI during a disaster is to evacuate disaster victims, analyze the needs of disaster victims, distribute aid, secure aid distribution and provide health assistance. PMI's current strategy is the six-hour-arrival-at-disaster strategy. PMI promises to carry out initial disaster emergency actions within six hours of a disaster. PMI's disaster management operations are supported by disaster response equipment and supplies.

PMI has two central warehouses in Banten to handle disasters in western Indonesia and Surabaya for eastern Indonesia. PMI divides its service centers into six regions to facilitate services in the event of a disaster, including transportation, communication, and logistics. The six warehouses are located in Surabaya, Semarang, Makassar, Padang, Karawang and Banjarmasin. However, in implementing these strategies, PMI still has weaknesses, one of which is poor logistics management, causing several problems. One of the problems encountered was the condition of relief goods that were damaged and unfit to be given to victims of natural disasters. Another obstacle is PMI's limited funds and the unpredictability of the aid. The amount of funds owned by PMI is different from that of BPBD, which is unlimited and budgeted in the Regional Budget (APBD). PMI funds rely solely on donations/assistance from the community and other institutions (including the government). PMI funds that come from the government are only grants. Assistance from the community comes in unpredictable amounts and times, both during and without disasters. The assistance that comes is sometimes not what is needed. For example, PMI often receives aid in the form of clothing, even though clothing is not really needed during a disaster.

4.3.1 The advantages and disadvantages of BPBD and PMI

Table 1

	BPBD	PMI
Financial	Unlimited, as funds are sourced from the state budget.	Limited, as it only relies on donations from the community and government.
Logistics Management	Good, because the supply of goods can be well organized. For example, BPBD does not have food stocks if there is no disaster.	Not good, because there are still damaged/expired aid items.
Fulfillment Speed	Must wait for approval from the regional head	Have a 6-hour arrival strategy.
Human Resources (HR)	Not enough, because we don't have volunteers	A lot, because it gets help from volunteers.
Fleet owned	Many but less sophisticated, such as trucks and other cars.	Quite advanced but limited in number limited in number, such as amphibious cars, helicopters

4.4 Private sector assistance

The private sector is an important part and needs to be involved in disaster management. The private sector has begun to be involved in disaster management but is still not much and less active so more involvement is needed. The participation of the private sector is regulated in the Regulation of the Head of the National Disaster Management Agency Number 12 of 2014 concerning the Participation of Business Institutions in the Implementation of Disaster Management.

An example of a private party that is usually involved is PT Jupiter Logistik Indonesia. PT Jupiter Logistik Indonesia has a team of volunteers with funds from the company allocated for disaster relief, as well as 1 trucking fleet that is on standby to be used to send aid to areas in need. In Cianjur earthquake, PT. Jupiter Logistic assisting the government by sending the aids likes staple food, clean water, and some other goods donation from local community nearby PT. Jupiter Logistic area. However, it can be said that the funds and assistance provided cannot meet the overall needs of the victims of the Cianjur 2022 earthquake. With the availability of PT Jupiter Logistik Indonesia, it has helped the government in disaster management. But arguably PT Jupiter Logistik Indonesia can respond quickly because the natural disaster area is still within the reach of the company, which is still in the Jabodetabek area.

The involvement of the private sector is only limited to CSR by providing assistance. The private sector can actually be involved in the disaster management system in Indonesia, especially in fulfilling its needs, especially to manage the assistance that the community wants to channel. The role of the community in disaster management needs to be known in advance to realize this. The method used to determine the role of the community is to conduct a survey.

4.5 Observation Results

The observation aimed to assess the extent of community engagement in addressing aid requirements, particularly in disaster response. Researchers utilized Google Forms for this assessment and distributed the form among their family, colleagues, and PT. Jupiter Logistics Indonesia employees. The results of our observation are depicted in the graph below:



Figure 3

From Figure 3, it is evident that 79% of the respondents have donated when a disaster occurred somewhere



Figure 4

In Figure 4, we can see that respondents who answered 'yes' mostly donated money, while the second highest response was for foods and drinks, and the third was for medicine.

**Figure 5**

Figure 5 shows that the majority of respondents give their donations to the private sector. Here, we can see that most of the community believes that the private sector is the best option for them.

5. Conclusion

The current system of meeting needs still requires deeper involvement of the private sector. Such cooperation with the private sector is a shared aspiration of various aid agencies in Indonesia. While the existing needs fulfillment system is already fairly effective, there is room for improvement to maximize its potential. One promising avenue for enhancement is to engage private sector entities in every region of Indonesia, particularly those most trusted by the local communities, in collaboration with PMI and BPBD. The private sector entities in question are the private logistics companies operating in Indonesia. These private companies can serve as intermediaries through which the local community can channel their assistance. The aid collected can then be reported to or delivered to the city's PMI for distribution to disaster victims. Although this proposed system is currently localized, the hope is that it will be adopted in other regions to enhance the fulfillment system, making it more responsive and effective.

6. Implications

The implication of this study is to evaluate the compliance system of relief efforts carried out by Indonesian aid agencies. Relief operations involve the government, private sector, and local communities. Adequate logistical support plays a crucial role in effective disaster management. This support must be timely, accurate in terms of location and targets, of high quality, in sufficient quantities, and tailored to specific needs. As demonstrated in the research report mentioned earlier, there is a significant need for improvement within the Indonesian government. To enhance the distribution of aid across Indonesia, the government should strengthen its collaboration with the private sector in various regions.

7. Research limitations

The limitations of this study stem from the researchers' constrained timeframe and the restricted scope of distribution observations, which were solely conducted through Google Forms and targeted family members, colleagues, and PT. Jupiter Logistic Indonesia employees residing within the Jabodetabek area. Future research could expand the distribution of the

Google Form to a wider area. It is essential to recognise that this case study, focusing on the Cianjur earthquake, cannot be directly extrapolated to the extensive and geographically diverse disaster-prone regions in Indonesia.

References

- Dr Zaroni. (2017). Artikel Logistik Bencana: Humanitarian Logistics, Sisi Lain Peran Logistik dalam Penanggulangan Bencana.
- Hidayat, Raden Didiet Rachmat., Mohammad Iqbal Firdaus, Lis Lesmini. (2017). Pengelolaan Gudang Logistik Kemanusiaan BNPB. *Jurnal Manajemen Industri Dan Logistik Vol. 1 No.2*, 3.
- Hidayat, Raden Didiet Rachmat., OIFebri., Euis Saribanon., Aisyah Rahmawati., Sandriana Marina., (2018). Peran Aktif Institut Transportasi Dan Logistik (ITL) Trisakti Dalam Meningkatkan Kesadaran Manajemen Kebencanaan Di Indonesia. *Prosiding PKM-CSR, Vol. 1*, 958.
- Hidayat, Raden Didiet Rachmat., Sandriana Marina., Lira Agusinta., Aswanti Setyawati., Aisyah Rahmawati. (2019). The Development Of Online Platform For Humanitarian Logistics. *9th International Conference on Operations and Supply Chain Management, Vietnam*, 3.
- Ishiwatari, M. (2015). Asian Development Bank Institute (ADBI), Tokyo Working Paper: Disaster risk management at the national Level
- Peraturan Kepala Badan Nasional Penanggulangan Bencana Nomor 23 Tahun 2014 Tentang Standarisasi Logistik Penanggulangan Bencana
- Rikisoraya, Ade., Harry Purwoko., Muhammad Iqbal Firdaus., N Alfaridy. (2020). Pareto Analysis Implementation For Covid-19 Outbreak Humanitarian Supply Chain By Indonesian National Disaster Agency (Bnpb) March – June 2020. *GROSTLOG 2020*, 785.
- Setiawan, Edhi Budi., Dian Artanti Arubusman., Zaenal Abidin. (2023). Sosialisasi dan Pelatihan Penanganan Bencana di SMPN 9 Kota Bekasi. *JOONG-KI: Jurnal Pengabdian Masyarakat Vol 2, No 3*, 719.
- Supendi, P., Priyobudi., Jatnika, J., Sianipar, D., Haidar, A., Heryandoko, N., Daryono., Prayitno, S., & Sudrajat, S. (2022). Analisis Gempabumi Cianjur (Jawa Barat) Mw 5.6.
- Wassenhove. (2012). Artikel Disaster Management, Humanitarian Logistik dan Supply Chains. *Buku Humanitarian Logistik dan Supply Chain Bencana Gunung Berapi*, 14.