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# Actor-Network and Non-Government failure in Jakarta flood disaster in January 2020

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**Abstract.** This research aims to discuss actors' network in handling flood disasters in DKI Jakarta in January 2020. With the increasing number of disasters globally and in Indonesia, the discussion about non-government actors' role in disaster response is relevant to disaster management studies. Disaster response, as one of the disaster management phases in the case of flood disasters, is crucial for reducing the impact of a catastrophe and increasing the public sector's resilience and society after a disaster happens. This research was conducted with mass-media content analysis, using the keyword "DKI Jakarta flood" to collect published news between 1-6 January 2020. Then, the collected news was analyzed with Discourse Network Analyzer. The analysis found that there were contributions from both government and non-government. Food support is the most common type of contribution that was chosen for disaster management assistance. The private sector and community organizations were the non-state actors that played a huge part in post-disaster aid. Although there are roles of non-state actors in disaster management, there are obstacles in its implementation. Some of those are unsupportive regulation, the absence of an institutional framework, and various actors' commitment to collaborative disaster management.

## 1. Introduction

Disaster management is an effort closely related to the achievement of sustainable development and mitigating climate change. As stated in The Sustainable Development Goals, sustainable development aims to carry out sustainable practices to mitigate the impact of human activities on the climate and synergize with efforts to reduce disaster risk. Climate change and human activities that have not fulfilled the aspects of sustainable development are one of the causes of the emergence of various disasters.

Along with evolutions in climate change and human behavior, natural disasters are rapidly increasing, including in Indonesia. Indonesia is a country that is prone to natural disasters, be it floods, earthquakes, and others. Flood disaster is one of the catastrophes that draws many concerns in Indonesia because of its frequent occurrence. It also occurs in strategic areas such as the capital city, DKI Jakarta. National Disaster Management Authority (*Badan Nasional Penanggulangan Bencana*), as indicated by Table 1, stated that 48 people died, and 627.648 people were affected due to flood disasters during 2020 [1].



**Table 1.** Indonesia disaster statistic in 2020 [1].

Type of Disaster	Occurrence	Casualties		
		Death / Lost	Injury	Affected
<b>Landslide</b>	730	20	11	627
<b>Floods</b>	568	48	15	627,646
<b>Puting Beliung</b>	471	6	35	245
<b>Fire</b>	157	0	0	0
<b>Gelombang pasang / abrasi</b>	18	0	0	13
<b>Earthquake</b>	11	0	0	0
<b>Volcanoes</b>	8	0	0	0
<b>Drought</b>	4	0	0	0

A flood is a natural disaster that occurs when the excessive flow of water submerges land, but a flood can also show that the Earth's damage is accelerated by human actions [2]. Some identified factors caused flooding. Jakarta is prone to flood because of its geographical location [3]. Changes in land use, for instance, as settlements caused an increase in surface runoff [2] [4] [3]. The decline in the land surface is also a factor that caused Jakarta to experience frequent flooding. Taking large amounts of groundwater can cause the land surface to decrease below sea level. Another factor is the drainage channel blockage caused by careless garbage disposal [3] [5].

The Meteorology, Climatology, and Geophysics Agency (BMKG) revealed that the climate change that occurred increases the risk and opportunities of extreme rainfall and triggers floods in Jakarta. Flooding in early 2020 happened in Jakarta and its surroundings due to extreme rainfall (more than 150 mm per day), which is down quite evenly in the DKI Jakarta area. This incident is similar to the major floods that occurred in DKI Jakarta in 2007 and 2015. Based on a historical review of BMKG daily rainfall data for 150 years (1866-2015), there is a corresponding trend between the increasing frequency of significant flood events in Jakarta and the increase in extreme annual rainfall intensity. If calculated with the initial events of 2020, this repetition period showed an increase of 2-3% compared to climate conditions 100 years ago [6].

Handling floods in DKI Jakarta involves both the local and central governments. The Ministry of Public Works has been working with the regional government of DKI Jakarta to work on the Ciliwung river normalization and artificial canal (*Sodetan*) project. Besides, the Ministry of Public Works has also dredged dams and prepared drainage systems. The government often states that flooding is a phenomenon that occurs due to nature and then carries out evictions of residents who live on the river banks. However, this sometimes becomes a political reason to clean up the area and gives high-end residential and shopping complexes to open in similar places [7]. The government tends to blame the victims of floods for creating floods, shifting the responsibility to find a solution [3].

Non-governmental organizations (NGOs) are also involved in managing the after-effects of floods. In 2020, the regional government of DKI Jakarta signed a memorandum of understanding with several NGOs to overcome floods [8]. Steinberg mentioned that Jakarta's biggest challenge in overall modernization is cooperation and transparency between citizens, the private sector, and local government [9]. For example, the Strategic Development Plan for 2002-2007 was made without facilitating citizen's participation. However, community participation has been held out in other programs, such as Jakarta Flood Management.

Similar researches had been conducted in the past. Previous studies discussed the suitability of ANT for deployment in a disaster-related context [10], ANT as a method and its controversies [11], and explored disaster risk governance as a network and an ecosystem in Asia and the Pacific [12]. Another article argued that ANT could be applicable as a tool for analyzing and elaborating hazard mitigation strategies in Zimbabwe [13]. This article reviews the contribution of actors and non-government failures in the Jakarta flood disaster in January 2020.

This study uses the actor-network theory as the perspective. Actor networks consist of both technical and non-technical elements. Actors can include humans, groups of humans, organizations, texts, images, and technical artifacts [10]. Actor networks are constructed results from a heterogeneous network of actors, consisted of humans and non-humans [11] [10], sociological and technological, thereby revealing issues at the socio-technical interface [10].

Community engagement can be found in almost every aspect of today's society. They serve to promote and strengthen a healthier relationship between citizens and restore citizen trust in both local organizations and the government. Citizen engagement in community affairs is important. Community engagement has the potential to create local networks of community members [14]. Involving citizens shows them that they can make positive changes in their communities. Community engagement can take the form of river clean-ups, education, public health, and so on. It can also present in disaster management. After experiencing losses and trauma caused by natural disasters, citizen engagement can act as a healing process to restore the feeling of being 'back in control' for communities that feel powerless. Community engagement can give useful knowledge, experience, and skills that help shape a stronger community in the future when facing a similar situation. There may be a different state of mind of people affected by the disaster as they suffered from loss. Community engagement in disaster management must provide a fair and accessible process that doesn't favor certain individuals or groups over others.

This research aims to see the involvement of various actors in handling floods in DKI Jakarta in January 2020. By looking at these parties' participation, this research will map the actors and the roles they perform. This study also aims to look at non-governmental parties' failure in handling flood disasters and investigate the factors that influence these failures.

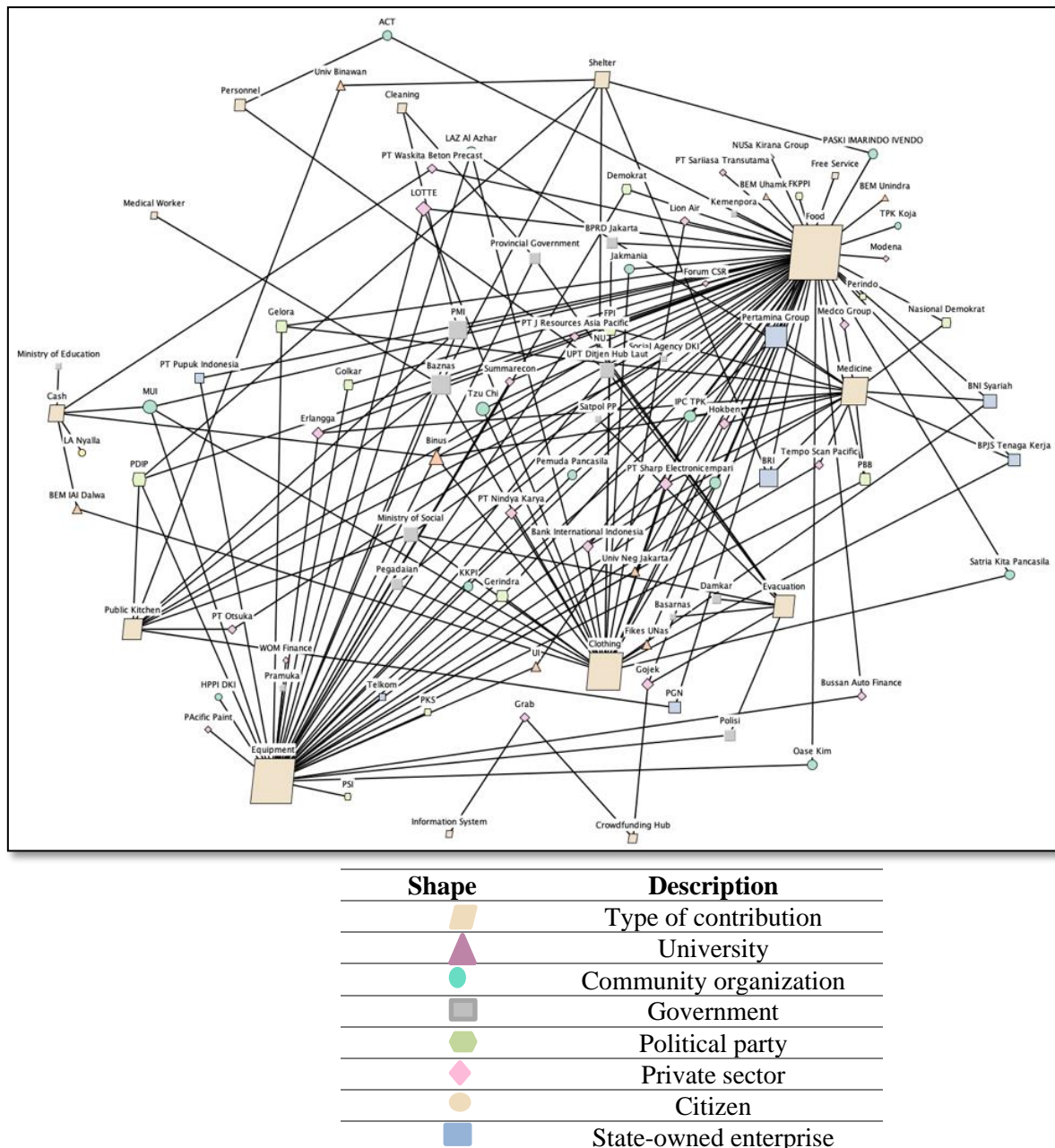
## 2. Method

This research uses a qualitative approach by analyzing secondary data to see various parties' involvement in handling floods in DKI Jakarta. The qualitative data will help this study elaborate on the relationship between the type of organization and its contribution to overcoming disaster effects. The more contribution, the more ties between actors and type of contribution. This study's data collection method was carried out with mass media content analysis using the keyword "DKI Jakarta flood." This study collect published mass media news between 1 January – 6 January 2020. There is a two-step of data analysis. Firstly, this research coded and found 209 statements from 81 actors/institutions by utilizing the Discourse Network Analysis application. Secondly, this study utilizes a tool called Visone to facilitate the visual exploration of the Discourse Network Analysis (DNA) output network. DNA enables the researcher to identify a person, organization, and concept. The person in this research is the name of the institution/organization. The organization is this research is the type of organization. In this study, the type of organization is government, community organization, political party, individual citizen, a state-owned enterprise, private sector, and university. The concept of this study is the type of contribution to the flood disaster response. This study quantifies the frequency of each person's type of contribution based on the information in the mass media. To increase the validity of the data, the analysis ignores duplicate mass media publications. Furthermore, there are two steps in the Visone application; the first step is to analyze the degree of centrality to explore the central node based on both organization and concept. The second step in the Visone application is a visualization of concept size based on frequency reference. The bigger of concept size, the higher the frequency. In terms of network, this study analyses a one-mode network and two-mode network. One mode network will illustrate the co-occurrence between the same variable. While the two-mode network illustrates the relationship between two variables.

### 3. Results and discussion

#### 3.1. Actor-Network

The content analysis indicates a contribution of various actors, both from the government and non-government, in handling the DKI Jakarta flood in 2020. This finding is consistent with the effort of DKI Jakarta Province to gather various stakeholders to manage the impact of flood disasters. As of 3 January 2020, two days after the flood incident, DKI Jakarta Province officially announced the provincial government's collaboration with 21 community organizations and private sectors to overcome the impact of flood disasters [15].

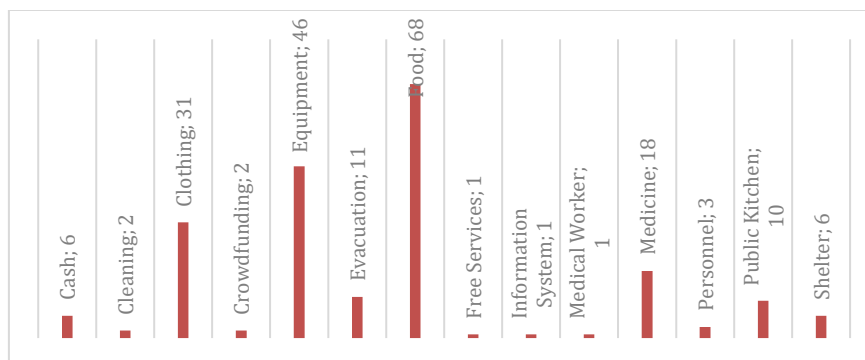


**Figure 1.** The contribution of diverse institutions to flood response in Jakarta flood

Source: Data analysis of 1-6 January 2020 news using Discourse Network Analyzer 2.0-beta25.jar and Visone.

This study analyses the actors' two-mode network to investigate the relationship between two variables, the type of organization and the type of contribution. The result implies that food is the most common type of disaster relief sent by the organizations. The parameter to quantify the type of contribution based on the number of cited inside mass media article. Figure 1 illustrates the size of food as a type of contribution is bigger than the other types due to the higher frequency chosen by the actors. Food is the most common commodity to be supplied. Food came in the form of raw groceries, instant food, drinking water, and snacks. Many actors deliver food to the shelter or directly to the affected area. The other most common type of contribution is equipment. Figure 2 shows 46 edges, the second-highest frequency, between the kind of contribution and the actors. This equipment came in many forms and sizes, ranging from simple cleaning and sanitary tools to diesel generators and vehicles.

The third most common item to be distributed is clothing. These clothes can be new or, at the very least, still in good shape. The fourth one is medicine, followed by a public kitchen, shelter, and cash, respectively. Temporary shelters and public kitchens might occur in university buildings, buildings owned by political parties, and other places for handling floods. Lastly, there are evacuations and provision of medical workers. These two were the least common types of help provided by non-governmental actors, with evacuations only conducted by community organizations and state-owned enterprises. Healthcare workers were only provided by political parties, the private sector, and community organizations.



**Figure 2.** Type of contribution of government and non-government to flood disaster response

Source: Analyze of a mass media report about DKI Jakarta flood disaster between 01-06 January 2020 that was analyzed with Discourse Network Analysis 2.0-beta25.jar

Based on the frequency of all actors' edge, the result indicates variation in each institution's involvement. By adding up each type of contribution mentioned in the news with the value of one (1), it can be found that Pertamina Group is the institution that makes the most contributions, namely in the form of medicines, free services, food, clothing, and equipment. However, the calculation of this frequency is only based on the number of quotes in each news that will not analyze the frequency based on each contribution's monetary value. The contribution based on monetary value and location is also difficult because the information of location and monetary value are not complete in each news.

This study also identifies the one-mode network investigating the same variable to find co-occurrence between actors or type contribution. The findings indicate that the community organization and private sector are institutions that have a similarity of edge. In the variable of the type of contribution, there was high co-occurrence between food and equipment.

### 3.2. The Role of Non-government Actors

Flood management requires community participation because the community itself may have the best knowledge about what they need. Non-governmental actors have been involved in managing floods in the capital city. The non-state actors consist of universities, community organizations, religious organizations, corporates, and political parties. These actors mostly supply food, shelter, medicine, and clothes. In some cases, major-scale CSR and well-developed NGOs provide inflatable boats, ambulances, and trucks to help evacuate and relieve the flood victims.

In investigating non-government actors' role in responding to the DKI Jakarta flood in January 2020, this study analyzes the actors' contribution. As shown in table 2, the findings indicate the number of donations of each type of organization, and in terms of frequency, the private sector gives a significant role. The frequency means the number of edges between organization and concept (the type of contribution). The high frequency shows that the private sector mentioned the most in the media helps handle floods in DKI Jakarta in early 2020.

**Table 2.** Type of organization, degree centrality, and frequency.

Type of Organization	Degree of Centrality	Frequency
Citizen	1.5625	1
Political Party	9.375	25
University	10.9375	17
Private Sector	14.0625	52
Community Organization	14.0625	39

Source: Analyze of a mass media report about DKI Jakarta flood disaster between 01-06 January 2020 that was analyzed with Discourse Network Analysis 2.0-beta25.jar

Meanwhile, the degree of centrality shows the degree of connectedness or the more edges the organization has in aggregate (the total degree of centrality of all actors/institutions). The higher the degree of connectedness, the more types of contributions associated with that type of organization. Based on the degree of centrality, private and community organizations are institutions with more links.

From the data we collected, the private sector is the most dominant actor to give support. The contribution was in food, equipment, cash, public kitchen, medicine, and clothing. After that, the community and religious organizations provided shelter, food, medical workers, public kitchen, clothing, medicine, and conducted evacuations. The third one is political parties, which donated equipment, food, clothing, managed public kitchens, provided shelter, and medical workers. After that, state-owned enterprises have the equipment, food, cash, public kitchen, clothing, and evacuations. The next one is universities that help by giving equipment, food, cash, clothing, medicine, and building public kitchens.

During the January 2020 flood, several universities, such as Dian Nusantara University, University of Indonesia, Binawan University, Jakarta State University, and Muhammadiyah Prof. Dr. HAMKA University, set out to assist people who suffered from the flood. The aid came in the form of groceries, temporary shelters [16], distributing clean water and necessities, such as diapers and sanitary pads. Universities might choose to work together with their student council, alumni, the government, and other parties to execute the plan. For example, the University of Indonesia involved the Faculty of Nursing Student Council, a medical team from the Faculty of Medicine, National Disaster Management Agency (BNPB), and a local public health center [17]. The University of Indonesia worked together with The Centre of Crises Faculty of Psychology to provide psychoeducation for the victims, especially women and children. They claimed that these actions' motives purely based on their sense of humanity and concern for fellow human beings who went through disaster [18].

Community organizations in DKI Jakarta have been active in helping the victims of floods. Indonesian Red Cross (PMI) gathered more than 400 people to assist victims of the flood, ten health



workers, four trucks, 13 ambulances, two double-cabin vehicles, four operational vehicles, and 11 rubber boats. They also set up four soup kitchens. Another example, the Satria Kita Pancasila and the Pemuda Pancasila organization also distributed food, clothes, and cleaning tools.

Religious organizations also took part in managing the flood disaster. Among these organizations are Tzu Chi, *Nahdlatul Ulama* (NU), *National Amil Zakat Body* (BAZNAS), Islamic Defenders Front (FPI), and Islamic Student Association (HMI). Tzu Chi helped by giving out clothes and food by using inflatable boats to reach the flood victims' houses. NU helped evacuate the victims through the NU Peduli team. They also created a soup kitchen, built tents for temporary shelters, and gave out mineral water, food, and clothes. Similar to NU, BAZNAS and FPI also conducted evacuations. Not only that, BAZNAS provided health services by working together with volunteers from BAZNAS Disaster Response (BTB), Healthy Home BAZNAS (RSB), *Lembaga Beasiswa BAZNAS Istimewa* (LBB), and BAZNAS Active Services (LAB). As for HMI, they helped to distribute food supply along with other organizations such as development Brigade Corp (CPB), Indonesian Islamic Student Movement (PMII), *Ikatan Pelajar NU* (IPNU), and a few other university student councils. They were organized by Ministry of Youth and Sports. Aside from distributing goods, they cleaned the houses that were affected by floods.

Through their CSR, corporations also tried to assist these victims by giving snacks, groceries, clean water, medicine, and other necessities. Large-scale corporations, such as Bank Rakyat Indonesia (BRI) donated inflatable boats. Corporates might choose to collaborate with NGOs to deliver their support. BNI Syariah worked together with Yayasan Hasanah Titik to distribute necessities, but their main focus was the trauma healing program to reduce the risk of mental issues that might emerge. Lion Air, Medco Group, Bussan Auto Finance (BAF), and another private sector also took part

Political parties, such as Partai Demokrasi Indonesia Perjuangan (PDIP), Golkar, Partai Solidaritas Indonesia, Partai Bulan Bintang (PBB), and Partai Keadilan Sejahtera (PKS) sent help by making soup kitchens, giving out foods, medicines, and equipment. The non-state actor's contribution to disaster response illustrates the strong commitment to collaborate to overcome the impact of the disaster that is very significant in disaster management. As reported in previous studies, flood disaster in Jakarta affects only households and business [19]. Several factors increase flooding vulnerability, including stakeholders underline that local community involvement is an important community response and adaptation [20]. This study's finding underlines non-state actors' role illustrates the non-state actor's commitment to delivering disaster response.

### 3.3. Non-Government Failure

The involvement of the non-state in the disaster is not only to disaster response but also to disaster management. This section will criticize the current obstacle that influences the participation of non-state actors in disaster management. Non-state actors have various roles in disaster management, such as increasing disaster awareness of the general public, supporting government programs, improving the emergency response capacity, promoting business continuity plans, etc. Therefore, there are few obstacles for the private sector or community to do so.

**3.3.1. Unsupportive regulations.** The existing regulations do not provide a space for the private sector to develop and accommodate their initiatives on handling disaster management according to their respective field of expertise. Without proper guidance and a clear arrangement, it is harder for the private sector to be involved in disaster management. This will prevent the private sectors from contributing to mitigation, preparedness, emergency response, and post-disaster recovery activities. Law of the Republic of Indonesia Number 24 of 2007 concerning Disaster Management, for example, does not specify the private sector's roles in disaster management. This regulation also does not clearly explain the private sector's position and authority in disaster management. It is only mentioned that to create effective disaster management, it needs all sectors, including non-government sectors, without further details on how that involvement should be done.



Moreover, existing laws do not provide a clear legal framework to regulate how private actors cooperate and collaborate. As a result, these private actors work independently on disaster management activities without collaborating with other private actors. These sectoral and unintegrated works will eventually lead to ineffective and inefficient disaster management, preventing collaborative disaster management from happening.

Instead of supporting non-state actors' involvement in dealing with floods, the existing regulation tends to limit non-state actors' participation. For example, the Director of WALHI, Tubagus Soleh Ahmadi, stated that the Regulation of Jakarta Governor limits non-state actors' participation, such as the community in flood prevention activities [21]. Tubagus said that the community could actively participate in flood prevention activities before the regulations are made [21]. After the existence of these regulations, community involvement was kind of limited.

*3.3.2. The willingness of government and private actors to collaborate.* Another issue is the willingness of both government and private actors to collaborate and involve each other to handle the emergency cooperatively. In most countries, the government act as the main actor in disaster management. The government takes control and is in charge of every emergency response activity. Sometimes, the government even works on all disaster management activities without engaging the private sector. This could happen mainly because of the government's lack of capacity and innovation to engage non-government actors in disaster response activities. One of the reasons why the government is not engaging the private actors is the lack of information. These information shortcomings are most likely on (1) complete information on what multiple sectors are spending, (2) what or where the private actors can best contribute in, (3) and strong evaluation data on what contributions or investment are supporting effective recovery [22].

On the other side, private actors also have this willingness issue. According to the Center for Strategic and International Studies research, there is a tendency for private actors to say 'here is what we have to offer' instead of asking 'what is needed' in the disaster response activity. This tendency indicates a lack of willingness of the private actors to fund the disaster response activity.

The government and private actors' willingness to collaborate can be seen in the Jabodetabek flood case. In dealing with the annual flood in the Jabodetabekpunjur area, the government made a Joint Commitment and Action Plan for Flood and Landslide Management [23]. The parties involved in signing this document are the Minister of Agrarian Affairs and Spatial Planning/Head of the National Land Agency (ATR/BPN), Minister of Home Affairs (Mendagri), Minister of Public Works and Public Housing (PUPR), Minister of Environment and Forestry (LHK) as well as the Minister of National Development Planning (PPN)/Head of the National Development Planning Agency (Bappenas). Based on this, it can be seen that this joint commitment only involves the government and related local governments without engaging private actors.

*3.3.3. The absence of an institutional framework in collaborative disaster management.* One of the arguments in the previous point highlighted how the government does not engage the private sector in disaster management. However, even if the government does engage the private sector in disaster management, there is still an obstacle faced by the private sector. The collaborative disaster management may have been executed, but no institutional frameworks are underlying these collaborations in some cases. The institutional framework refers to rules, formal structures, or norms [24] that outline the whole collaborative process. The absence of an institutional framework creates obscurity as the parties' roles and responsibilities are not defined clearly. Poor communication and coordination are unavoidable and will eventually lead to ineffective goal attainment. Besides, the private sector can help fund and provide other resources to increase government capacity in disaster management. However, if there is no clear framework about the financial aspect of how the funding will be done, successful collaborative disaster management is unlikely to happen. A previous study of community responses also highlights the uncoordinated response [20].

In the context of the 2020 Jabodetabek flood, it can be seen that there was an absence of an institutional framework that underlies the implementation of flood management. As mentioned in the previous point, there is indeed a Joint Commitment and Action Plan (*Renaksi*) for Flood and Landslide Management to deal with Jabodetabekpunjur floods in an integrated manner. However, the action plan was only signed in June 2020, or six months after the big floods hit the Jabodetabek area. Also, the *Renaksi* has not included the private sector in its action plan, and there are still no clear roles and responsibilities for each party.

#### 4. Conclusion

The study indicates that government and non-government actors' involvement in disaster response is pivotal to overcome disaster impact. The private and community organizations play a significant role in delivering disaster relief to Jakarta's affected area. The finding implies that further discussion to establish the institutional design to strengthen collaborative processes among actors in all disaster management levels is crucial. Further research about the solution to handle disaster response barriers is a potential topic to answer this finding.

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