Model of stakeholder collaborative for disaster logistics in Indonesia

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Abstract. The goals of this research is mapping the role and contribution of each stakeholders and developing a model of stakeholders collaboration in disaster preparedness logistics activities in Indonesia. The approach used in this research is a qualitative research approach with the type of descriptive explorative research. The model produced by this research involves five groups of stakeholder, namely government, society, private sector/industry, media and scientists. The role of the five stakeholders is mapped in three types of stakeholders, namely key stakeholders primary stakeholders and secondary stakeholders. Disaster preparedness logistics activities in this research are divided into four activities, namely facility location, stock prepositioning, resource allocation, and relief distribution, while the collaboration indicators set in this research are partnership, participation and network. The mapping of stakeholders and the formulation of stakeholders collaboration models in this research was carried out by the FGD (Focus Group Discussion) process, which consisted of representatives from all groups of stakeholder. The concept model obtained from this paper can be used as a basis for the preparation of the blueprint of the National Logistics System for Disaster Management in Indonesia that can help disaster management actors collaborate in carrying out logistics activities in disaster preparedness, so that logistical activities in disaster preparedness can be carried out quickly, precise and accurate.

Keywords: Stakeholder Collaborative, Logistics, Disaster Logistics, Disaster Preparedness

1. Introduction

Indonesia occupies a very active tectonic zone because three large plates of the world and nine other small plates meet each other in the territory of Indonesia. This makes the territory of Indonesia very vulnerable to disasters. Disasters are non-routine events that require irregular responses and handling as well. Governments and disaster management agencies cannot rely on normal procedures in carrying out appropriate and adequate disaster response, so that it requires a good disaster management logistics system design. Management of logistics systems in disaster management is an integrated approach in managing disaster relief goods. Starting with commodity selection, finding resources, procurement, quality assurance, packaging, shipping, transportation, warehouse storage, inventory management, and
insurance. This activity involves many different actors but all activities carried out by all actors must be well coordinated. Disaster management requires the involvement of all parties. According to UNISDR[1], stakeholders who must be involved in disaster risk reduction are grouped into five groups, namely: Government (Regulator); Society (Accelerator); Private/industries (Enabler); Media (Catalysts); and Scientists (Concept maker). The five stakeholders must work together and collaborate well in disaster risk reduction.

Improving the quality of services in disaster management can be done well if all actors involved in disaster management work together, collaborate and cooperate in carrying out disaster management activities. Thus, a pattern or model of collaboration among stakeholders is needed in the implementation of disaster management logistics activities that are suitable to be implemented in Indonesia. This paper aims to carry out the mapping roles and positions, as well as the contribution of each stakeholder in disaster preparedness activities, as well as providing recommendations on stakeholder collaborative models in disaster logistics preparedness to improve disaster response performance in Indonesia. Research on stakeholder collaboration has been carried out by Fairuz[2], a study conducted on inclusive development in the tourism sector in Indonesia. Thus, the research conducted contributes to the enrichment of the application of the collaboration model in Indonesia.

2. Methods

2.1. Stakeholders Identification

According to Bryson [3], stakeholders are "individuals and groups who are interested, both from within and from outside the organization, who influence or are affected by the goals and actions of the organization. According to ISO 26000 SR, stakeholders are defined as "individuals or groups who have an interest in the decisions and activities of an organization". Based on the definition above, stakeholders in this research are defined as individuals or certain groups who can come from the community, or community leaders and organizational officials who have the same interests and specific goals.

According to UNISDR [1], stakeholders who must be involved in disaster risk reduction are grouped into five groups, namely: Government (Regulator); Society (Accelerator); Private/industries (Enabler); Media (Catalysts); and Scientists (Concept maker). Stakeholder identification in this research was carried out by FGD (Focus Group Discussion). Participants who attended the FGD conducted were representatives of each stakeholder group. The results obtained from the stakeholder identification process are presented in Table 1.

| Stakeholder       | The National Disaster Management Agency (BNPB); Ministry of Social Services; Ministry of Transportation; Indonesian National Army; and Indonesian National Police. |
|-------------------|-------------------------------------------------------------------------------|
| Government        | Affected community; Association of Community (e.g. Forum Logistik Penanggulangan Bencana, Masyarakat Penanggulangan Bencana Indonesia (MPBI)); Non-Governmental Organization (e.g. Indonesian Red Cross-PMI and ACT) |
| Society           | Association of Industry (e.g. AsosiasiPengusahaTruk Indonesia, Asosiasi Perusahaan JasaPengirimanEkspres Indonesia, and Asosiasi Logistik dan Forwarder Indonesia); Logistics Service Provider company (e.g. PT. Kereta Api, PT. Jasa Marga. Tbk., PT. Pelabuhan Indonesia, and PT. Angkasa Pura) |
| Private Sector    | Electronic and printed mass media; Social Media. |
| Scientists        | Research Centre (e.g. PusatPenelitian Mitigasi Bencana ITB, Pusat Studi Transportasi dan Logistik UGM, Supply Chain Indonesia (SCI), Asosiasi Logistik Indonesia (ALI), Indonesian Logistics Community (ILC)); Universities (e.g. Program Studi Magister Manajemen Bencana UGM, Sekolah Tinggi Manajemen Logistik Indonesia) |
2.2. **Determine Disaster Logistics Activities**

UNISDR [4] states that the disaster management process consists of phases, namely: (a) Pre-disaster phase which includes prevention activities, disaster risk reduction, preparedness, and early warning; (b) During disasters, which include emergency response activities to alleviate the suffering of affected communities, such as search and rescue activities (SAR), emergency assistance and displacement; and (c) Post-disaster, includes recovery, rehabilitation and reconstruction activities. The disaster management cycle is divided into four phases, namely mitigation, preparedness, response, and recovery [5].

The formulation of the model carried out in this research will be focused on the preparedness phase, because this phase is an important phase and greatly determines the success of disaster management in the next phase. According to Rodriguez-Espindola et al. [6], logistics activities in the preparedness phase consist of four main activities, namely: Facility Location Planning; Stock prepositioning; Resource Allocation, and Relief Distribution. More detailed activities for each activity illustrated in Figure 1.

![Figure 1. Logistic Activity for Disaster Preparedness](image-url)

2.3. **Stakeholders Mapping**

Besides having to know who the stakeholders are, disaster management actors also need to know the type of each stakeholder, so that the achievement of program goals can be done better. There are three types of stakeholders [3], namely:

1. **Primary Stakeholders**, are stakeholders who are directly influenced by the activities or programs that are carried out and or the objectives to be achieved by a particular organization. The influence here can be positive or negative.
2. **Secondary Stakeholders**, namely stakeholders who are not directly influenced by the activities or programs that are carried out and or the objectives to be achieved by a particular organization. The influence here can be positive or negative.

3. **Key Stakeholders**, are stakeholders who can have a positive or negative influence on the activities or programs that are carried out and or the objectives to be achieved by a particular organization. This stakeholder is very important to achieve the goals and implement the program.

Stakeholders mapping in this research was carried out by FGD. The FGDs that have been conducted also produce mapping of key stakeholders, primary stakeholders, and secondary stakeholders for each preparedness logistical activity. The FGD was held for one full day, and was carried out in two sessions. The first session was the FGD to carry out the process of stakeholder identification and mapping, while the second session was a formulation session of the collaboration model concept. The results of this mapping are presented in Table 2.

### Table 2. Disaster Management Stakeholders in Indonesia

| Preparedness Activities | Government | Society | Private Sector | Media | Scientist |
|-------------------------|------------|---------|----------------|-------|-----------|
| Facility location       | K          | K       | K              | K     | S         |
|                        | K          | S       | K              | P     | S         |
|                        | K          | K       | S              | S     | S         |
|                        | K          | P       | S              | S     | S         |
|                        | K          | S       | S              | S     | S         |
|                        | K          | S       | S              | S     | S         |
| Stock pre-positioning  | K          | S       | K              | P     | K         |
|                        | S          | K       | S              | S     | S         |
|                        | K          | P       | S              | S     | S         |
|                        | K          | S       | S              | S     | S         |
|                        | K          | S       | S              | S     | S         |
| Resource allocation    | K          | K       | K              | K     | P         |
|                        | S          | K       | P              | S     | K         |
|                        | K          | S       | S              | S     | S         |
|                        | K          | S       | S              | S     | S         |
|                        | K          | S       | S              | S     | S         |
| Relief distribution    | K          | K       | K              | K     | P         |
|                        | K          | K       | P              | S     | K         |
|                        | K          | K       | S              | S     | S         |
|                        | K          | K       | S              | S     | S         |
|                        | K          | K       | S              | S     | S         |
|                        | K          | K       | S              | S     | S         |

K: Key Stakeholders
P: Primary Stakeholders
S: Secondary Stakeholders

1: The National Disaster Management Agency (BNPB);
2: Ministry of Social Services;
3: Ministry of Transportation;
4: Indonesian National Army; and Indonesian National Police.
5: Local Government
6: Affected community
7: Association of Community
8: Non-Governmental Organization (e.g. Indonesian Red Cross-PMI and ACT)
9: Association of Industry or Logistics Service Provider Company
10: Printed Mass Media
11: Electronic Mass Media;
12: Social Media
13: Research Centre
14: Universities

The **Primary Stakeholders** in this research are affected communities, because with good collaboration among stakeholders, the affected communities will become stakeholders who directly
receive positive influences. Because all stakeholders involved in preparedness logistics planning have collaborated well, the delivery of relief goods has become more precise and faster, so the suffering of affected communities can be reduced. Supporting stakeholders or secondary stakeholders in this research are mapping the roles and positions, as well as the responsibilities, and (iv) providing funding and knowledge resources [7]. Based on the indicator of Ishiwatari[7], then FGD stage 2 was carried out, namely a discussion process to confirm the collaboration indicators which would be suitable for collaboration among stakeholders in preparedness logistics activities in Indonesia.

The results of the FGD conducted concluded that the collaboration indicators to be used in this research were grouped into three, namely:

1. **Partnerships**, this collaboration indicator is characterized by program among stakeholders involving all key stakeholders; agenda and efforts for cooperation among stakeholders.

2. **Participation**, this collaboration indicator is characterized by institutionalization of collaboration among stakeholders; periodic meetings and proportional division of tasks for each stakeholder.

3. **Networking**, this collaboration indicator is characterized by the existence of information and communication media among stakeholders.

### 3. Result and Discussion

The concept model involves five groups of stakeholder, namely government; society; private sector/industry; media and scientists, in accordance with UNISDR [1]. The role of the five stakeholders is mapped in three types of stakeholders, namely key stakeholders; primary stakeholders; and secondary stakeholders, this mapped related to Bryson [3]. Disaster preparedness logistics activities in this study are divided into four activities, namely facility location; stock prepositioning; resource allocation; and relief distribution; this is related to Rodriguez-Espindola et al.[6], while the collaboration indicators set in this study are partnership; participation; and network, this collaboration indicators related to Ishiwatari[7].

The results obtained from this research are mapping the roles and positions, as well as the contribution of each stakeholder in disaster preparedness logistics activities, as well as providing recommendations on stakeholders' collaboration models in disaster preparedness logistics activities to improve disaster management logistics performance in Indonesia. The concept of the collaboration model obtained from this research illustrated in Figure 2.

**Partnerships** can be stated as well if there is a work program, agenda and cooperation involving all stakeholders. The work program is a work program that deals with planning preparedness logistics activities to respond to disasters in Indonesia. Examples of partnerships that can be implemented are:

1. Partnership between BNPB, BPBD, and the Ministry of Social Services (government) with the Association of Logistics Service Providers (private) in the distribution of relief goods or disaster management equipment and logistics. The transportation resources owned by the government are currently very limited, while the private sector (e.g. the Indonesian Truck Entrepreneurs Association) has many transportation resources and is spread throughout
Indonesia. If there is a partnership between the government (BNPB) and the private sector such as APTRINDO (Indonesian Truck Entrepreneurs Association), then the delivery of relief goods can be carried out anytime and anywhere.

2. Partnership between BNPB, BPBD and Ministry of Social Services (government) with scientific groups (research centers or universities) in terms of conducting research and design of distribution systems or determining supplies of relief goods, the response process to disasters will be more precise and faster, so that suffering communities affected by disasters can be reduced.

**Participation** in stakeholder collaboration is stated to be well implemented if there is institutionalization between the government and the private sector and periodic meetings and proportional division of tasks among stakeholders in planning disaster preparedness logistics activities. This institutionalization process is important in collaboration, because institutionalization or signing of the MoU will be a legal guideline for implementing the collaboration. With the MoU, stakeholders will have certain obligations and authorities legally in carrying out their respective roles when participating in collaboration.

**The network** is declared to be running well if there is an online and offline information and communication media among stakeholders in planning disaster preparedness logistics
activities. Currently there are several communication media available. The communication media is online communication, namely the WhatsApp or Telegram group. An example of network media that currently exists is the WAG of KLASNASLOG PB (National Disaster Management Logistics Cluster). The members of this group consist of community representatives (members of associations or humanitarian organizations), the government (The National Disaster Management Agency-BNPB and Ministry of Social Services), NGOs (Indonesian Red Cross-PMI and ACT), research teams (members of the study center team or Higher Education research centers). Because there is no binding institutionalization among stakeholders, this group or network is still informal, formed only because of the similarity of the mission and interest in humanitarian activities.

4. Conclusion
The model obtained from this research is a model of stakeholder collaboration in disaster preparedness logistics activities in Indonesia. This model involves five stakeholder groups, namely: Government, Society, Private Sector, Media, and Scientists. This five stakeholders are mapped in three types of stakeholders, namely: key stakeholders, primary stakeholders and secondary stakeholders. The model also focuses on disaster preparedness logistics activities which are divided into four activities, namely Facility Location Planning; Stock prepositioning; Resource Allocation, and Relief Distribution, while the collaboration indicators set in this research consist of networks, participation and partnerships.

The model obtained from this research is still a concept, has not been validated and tested, so this model cannot be declared as a valid model to be implemented in the implementation of stakeholder collaboration in disaster preparedness logistics activities in Indonesia. The approach applied in this paper is a descriptive exploratory research approach. The concept of stakeholder collaboration model for disaster preparedness in this paper was produced through FGD (Focus Group Discussion) and in-depth interviews with relevant stakeholders. When the FGD process is conducted, it is possible that FGD members do not express their opinions honestly or are hesitant to express their thoughts, or there may be FGD members who dominate and vocal influence the results of the FGD. So there is a possibility that the FGD’s results are biased. In order not to be biased, it is recommended for further research to use quantitative methods in developing a stakeholder collaboration model of disaster preparedness.

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