LOGISTICS DISTRIBUTION PLANS DURING EMERGENCY RESPONSE IN INDONESIA WORLD FOOD PROGRAM

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ABSTRACT

Taking into consideration the geographical location of West Sumatra is prone to natural disasters, the Indonesian government and communities should prepare well for dealing with natural disasters that may be happen anytime. One of preparedness needs to be done is to determine the entry point of logistical assistance as well as delivery route during the emergency response phase. Therefore, this research was conducted to plan for the logistics distribution during emergency response, designed by the World Food Program (WFP) as NGOs and leader of the international humanitarian community's logistics coordination and response. This research used a qualitative descriptive analysis technique to describe the airports and ports to be used, as well as the transportation. As the result, Medan nominated as the main entry point for international actors while Jakarta as the main entry point of national actors. Furthermore, routes and modes of transportation that will be used for the delivery of relief items divided into three phases.

Keywords: distribution plan; emergency response; disaster management

INTRODUCTION

Over the last decade Indonesia has experienced about 150 severe natural disasters. Indonesia's vulnerability to natural disasters and man-made disasters will be increase due to rising population density in disaster-prone areas, the economic and social gaps, high levels of poverty, and increased frequency of hydro-meteorological hazards as a result of climate change, among the various factors. One area that is prone to natural disasters is West Sumatra. One of earthquake that happened on 30 September 2009 there were 16 districts/cities in West Sumatra province affected by the earthquake, about 1,900 people death, 1200 people injured and 6,554 people were displaced. The research itself is getting to know the logistics distribution plan of Word Food Programme (WFP) during emergency response in Indonesia and to identify the entry point of supply chain corridor for receiving and consolidating international humanitarian assistance. Also, to know the delivery route and transportation modes of international humanitarian assistance during emergency response based on West Sumatera earthquake scenario.

LITERATURE REVIEW

Logistics distribution planning during emergency response designed by World Food Program (WFP) should be considered such as: 1) logistics distribution plan will be taken into account large-scale disaster or a "level 3" and the government has to declare it a national disaster and asked for international support for emergency response; 2) system of national and international clusters will be activated and

humanitarian actors will respond through a system of regional and global support, including the provision of funds; 3) all emergency response only focus on logistic needs early stage and consider only 4 to 6 first weeks of operation, taking into account the response speed, the air operation was prioritized; 4) immediately adjacent logistics infrastructure or damaged in the disaster zone is assumed to not be able to function; 5) the road network that accesses the coastal communities are also expected to become dysfunctional, so the helicopter and maritime operations are taken into account; 6) the opinion that predicts the situation in the disaster zone will cause a lot of variables and operations will be difficult. Refer to the designation, the plan will be limited to upstream operations such as: 1) initial air entry points for international flights must have the capacity to provide integrated services for all types of aircraft and handling of related goods such as; 2) ground handling equipment and service providers, customs, immigration, etc.; 3) the entry point must have an initial sea port services for managing the delivery of containerized cargo, bulk and conventional cargo; and 4) logistics capacity assessment only consider existing infrastructure and does not calculate future plans relating to the expansion and development facilities.

RESEARCH METHODS

The study uses qualitative descriptive analysis technique to describe the airports and ports to be used for logistics distribution planning, as well as the transportation.

RESULTS AND DISCUSSION

A. Scenario Details

We used logistics distribution planning response based on scenario detail of West Sumatera Earthquake which can be seen in Fig. 1 (BPBD, 2007). The figure describes the scenario of epicenter of West Sumatera Earthquake. Characteristics of the scenario can be seen in Table 1 (Goss, 1996).

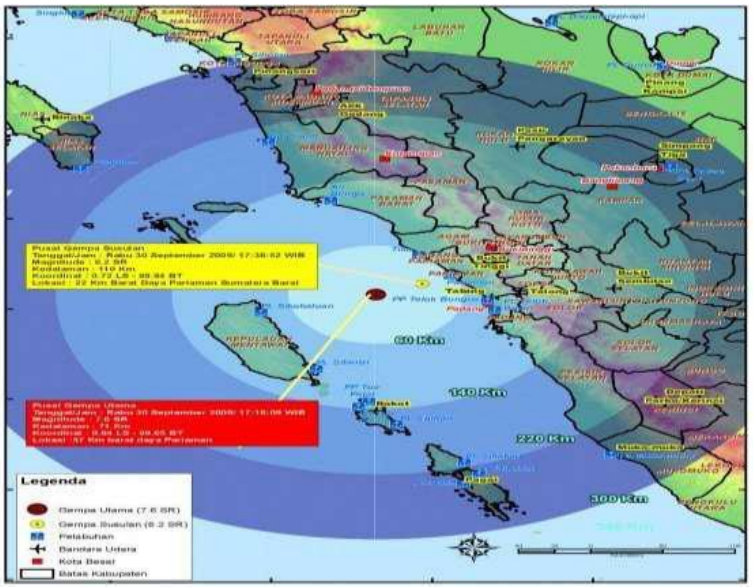

Figure 1. Epicenter of West Sumatera Earthquake's Scenario
Characteristics of the scenario can be seen in Table 1 (Goss, 1996).
(BNPB,2008,2010,2012) UU No.24/2007; PP No. 23/2008)

Table 1. Scenario Detail of West Sumatera Earthquake

No.	Items	Description
1.	Time of Earthquake	Monday, 10 AM (WIB)
2.	Magnitude	8.8 Richter Scale
4.	Epicenter	150 km Southwest of Padang City
5.	Affected areas	Affected areas assumed to be approximately 600 km from Singkil (125 km Northwest of Sibolga) to the Northwest, to border of WesSumatra Province. Bengkulu (180 km Southeast of Padang) in the Southeast.
6.	First tsunami waves	Reached the Western of Mentawai island area in 5-10 minutes, 10-15 m height of sea surface.
7.	Tsunami waves of aftershocks	Reached the Western coast of West Sumatra in 20 minute, 8-10 height of sea surface.
8.	Tsunami hit areas	2-3 km in lowlands
9.	Duration	3-4 hours after the earthquake with three times the land spike
10.	Consequence	Died 259,000 persons Serious Injury 224,397 persons Other injuries 118,106 persons Lost and evacuate 662,340 persons Destruction/damage : • 20% of Roads and Bridges • 40% of health facilities and 35% water facilities • 40% Electricity Networksand 20% Communication Networks • 100% Airports and 80% Ports Lack of access to: • Shelter for 300,000 households • Water Supply for 400,000 people • Sanitary facilities (latrines) for 200,000 households • Supplies Eating & Goods not food for 600,000 people • Emergency Medical Care to 100,000 people • HealthFacilities 200,000 households
11.	Impact	Structures massive damage and infrastructure in the Mentawai islands and the west coast of West Sumatra, as well as creates lot of casualties in densely populated areas of Padang city.

B. Supply Chain Corridor

We analyzed the supply chain corridor based on the characteristics of the earthquake scenario, and proposed research question as follow: The entry point of supply chain corridor for receiving and consolidating international humanitarian assistance during emergency response based on West Sumatera earthquake scenario. Based on the WFP logistics capacity assessment, there are two potential corridors as a transportation hub for accessing multimodal of West Sumatera namely north corridor - serves as the main entry point is the international field and south corridor - serves as a national key entry point is Jakarta.

1. North Corridor

There are five points in each corridor with respective functions such as: 1) the entry point for international air shipment; 2) entry points of international sea shipment; 3) humanitarian staging area;(Angriawan et al;2012; Van Wassen hove; 2006 4) forward logistics hub; and 5) helicopter operating base. Kuala Namu International Airport Medan serves as the main entry point of international and humanitarian staging areas for international supply chain due to the combination of adequate physical infrastructure and operational capacity. Pekanbaru International Airport identified as alternative entry point air and also forward logistics hub during the early stages of an emergency response considering its strategic location at the confluence of potential routes between north and south corridor, and located relatively close to the disaster zone. Facility that can be used is the Sultan Syarif Kasim II International Airport Pekanbaru with a large open area between the main runway and cargo areas. In addition, the sports facilities in the city of Pekanbaru is Rumbai Stadium which has a good infrastructure for temporary storage.

Figure 2. North Corridor Access

There is another potential alternative as Helicopter Operating Base (HOB) is a West Pasaman Airport, but because the distance is closer to these areas so it is possible that this location will be included in the affected area or affected. When access to the airport can be quickly reconstructed, then the airport will play a strategic role for the distribution of aid to the disaster zone. Next alternative is Sibolga City, Horas Stadium and Korem 023 Kawal Samudera. The second location was chosen for the facility in Sibolga Port inadequate, as storage facilities are limited.

Figure 3. Helicopter Operation Base of North Corridor

2. South Corridor

Considering that the majority of respondents nationally will operate in Jakarta then certainly corridor supply chain originating from Jakarta very important role in the emergency response to the West Sumatra. Halim Perdanakusuma International Airport, Jakarta, will be the main entry point and HSA for national supply chain. The advantage of selecting Jakarta as a key entry point is Jakarta has become an international transport hub.

Figure 4. South Corridor Access

C. Approach Phases

We analyzed the approach phases based on the characteristics of the earthquake scenario, and proposed the second research question as follow: The delivery route and transportation modes of international humanitarian assistance during emergency response based on West Sumatera earthquake scenario. The distribution logistics emergency response plan is divided into three phases approach corridor access to air, sea and land assuming damage to infrastructure in the regions affected by the earthquake, landslides, and tsunamis. The three stages are:

1. Phase 1 very limited access to affected areas

Estimated access to the affected areas in the first phase is very limited. The available airports in the stage are Halim Perdanakusuma International Airport (Jakarta), Kuala Namu International Airport (Medan), Sultan Syarif Kasim II International Airport (Pekanbaru), Fatmawati Soekarno International Airport (Bengkulu), dan Tobing Airport (Sibolga). Fixed wings route in the stage from two cities as the humanitarian staging area (Jakarta and Medan) to forward logistics hub (Pekanbaru, Bengkulu and Sibolga). Rotate wings route in phase I from three cities as the helicopter operating bases (Sibolga, Pekanbaru and Bengkulu) for three geographical coverages (South Nias island, coastal area affected and Mentawai island). The access road to the affected area in the first phase for land transportation truck was Jakarta, Medan and Pekanbaru. Land route in this stage from origin (Jakarta and Medan) to destination (Pekanbaru and Bengkulu and also Pekanbaru and Sibolga). Meanwhile, maritime route in this stage utilized forward logistics hub (Sibolga and Bengkulu) under geographical coverage (South Nias island, coastal areas affected, and Mentawai island).

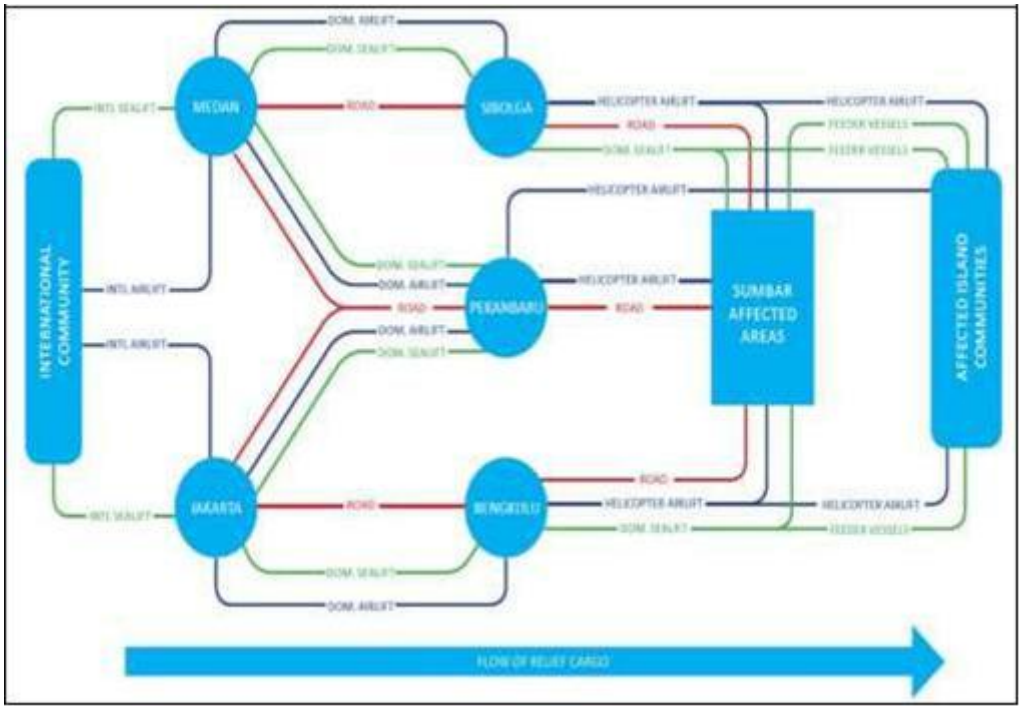

Figure 1. Phase I

2. Phase 2 available in limited access to affected areas

Estimated access to the affected areas in the second phase is still limited. There are two rights that requires urgent repairs emergency which Minangkabau International Airport and Air Force Base Tabing because of its location close to the disaster zone. However, the Minangkabau International Airport has limitations in terms of parking and storage space, while Air Force Base has limitations for fuel supply, runway length and storage. The access road to the affected area in this second phase was reconstructed, while the roads in the affected areas still recovering from damage and rubble. Accordance with the first phase, there are additional corridors which three cities as FHL such as Pekanbaru, Sibolga, and Bengkulu to additional facilities such as Bukittinggi, West Pasaman, Padang, Mukomuko and Kerinci. Land operations focused on the development of the supply lines to the forward operating base helicopter in order to reach many isolated communities. The distribution in the second phase still takes into consideration geographical, (Mangan, Lalwani, & Butcher 2008) security, and environmental conditions. The distribution process will be effective due to the holding of additional hubs for air transport that are closer to the disaster zone and remain in safe condition. Some infrastructures were still in reconstruction process. The transportation modes utilization also adapts to environmental conditions.

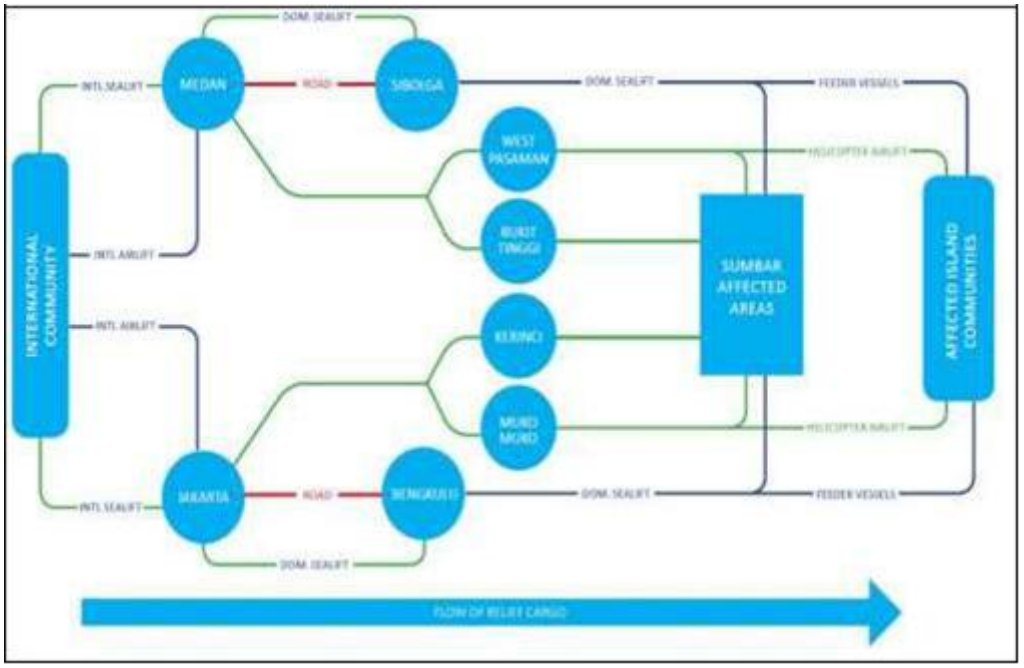

Figure 2. Phase II

3. Phase 3 provided access to and within the affected areas

Airport in Padang at this stage was reoperated and mostly in Mukomuko, Kerinci Helicopter Operations, West Pasaman and Bukittinggi discontinued and transferred to the airport in the city of Padang. All air transport will be in Jakarta and Medan to bring emergency relief goods directly to the Padang airport. Some helicopter operations continue from Padang, Sibolga, Pasaman Barat, Mukomuko and Kerinci heading to the affected areas, the islands of South Nias and the Mentawai Islands. Ground transportation from the international point of entry (Jakarta and Medan) in the third phase can be placed

directly to Sumatera because of the existing roads in the affected areas have been cleared and accessible. Moreover, considering the distribution of Padang to the affected communities can be performed, some additional hub was established in Padang such as storage facilities and truck staging. Land operations are no longer focusing on the needs of FLH as a transit point because of FLH will be moved to a more appropriate location. The use of air transport was entering the last stage because access roads are adequate, so it will be more effective and efficient use of land transport. International sea transport at the stage can go directly to Padang. Additionally, the carrier or RORO and distribution maritime activities to the affected areas in coastal locations can be performed. Teluk Bayur Port in Padang and the Mentawai islands along the harbor is back operating again. Maritime distribution activities will be managed from Teluk Bayur harbor. Considering that the location of the disaster-affected areas is coastal areas, the maritime operations will play an important role in a long time, especially in the context of the recovery and rehabilitation of island communities. The distribution process of relief goods delivery in the phase will come more easy because of the availability of existing infrastructure. Some distribution points are discontinued in order to cut the cost. The distribution process will be effective because international relief goods can be directly delivered to the mobile storage in the disaster zone. The use of transportation modes will also be accomplished with needs.

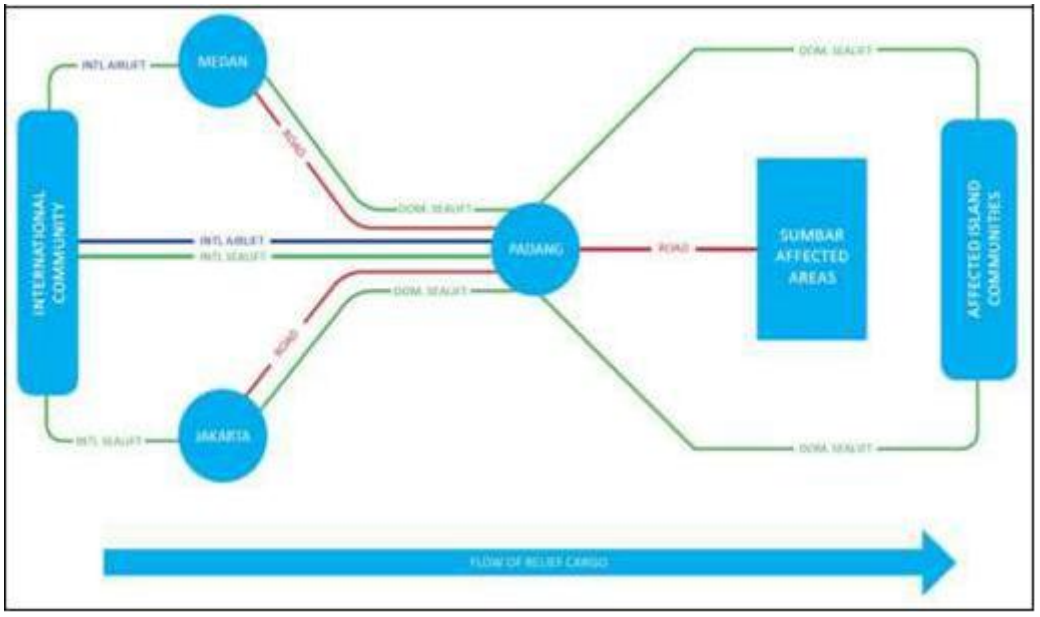

Figure 3. Phase III

CONCLUSION

The result of our study is the entrance corridor of international aid and relief goods delivery route, divined as international north corridor and national north corridor and national south corridor. The international north corridor can be classified as follow: 1) Kuala Namu International Airport, Medan acts as the international air entry point; 2) Sultan Syarif Kasim II Airport, Medan acts as the alternative air entry point; 3) Belawan Port, Medan acts as the international sea entry point; 4) Sibolga Port, Sibolga acts as the alternatie sea point; 50Kuala Namu International Airport, Medan acts as the humanitarian staging area; 6) Sultan

Syarif Kasim II Airport, Medan acts as the forward logistics hub; and 7) Pangkalan Militer Agam 0304 Bukit tinggi and Pasaman Barat Airport, Padang act as the alternative forward logistics hub. Meanwhile, the national south corridor can be classified as follow: 1) Halim Perdana Kusuma International Airport, Jakarta acts as the international air entry point; 2) Soekarno Hatta International Airport, Jakarta acts as the alternative air entry point; 3) Tanjung Priok Port, Jakarta acts as the international sea entry point; 4) Pulau Baai Port, Bengkulu acts as the alternative sea point; 5) Halim Perdana Kusuma International Airport, Jakarta acts as the humanitarian staging area; 6) Sultan Syarif Kasim II Airport, Medan acts as the forward logistics hub; and7) Mukomuko Airport, Bengkulu and Depati Parbo Airport, Kerinci, Jambi act as the alternative forward logistics hub.

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