ABSTRACT

Indonesia is a country formed by four tectonic plates: the Asian tectonic plate, the Australian tectonic plate, the Indian Ocean and the Pacific Ocean. This increases the risk of natural disasters in Indonesia, with approximately 3,542 natural disaster events occurring in 2022. For West Java iin 2022, 1,290 earthquakes were recorded in the West Java region. Of these, 540 earthquakes occurred at sea, mostly in the southern part of Java Island, while 640 earthquakes occurred on land at shallow depths. A total of 106 earthquakes were felt by the public, and one that caused significant damage was the one that occurred in Cianjur Regency. A 5.6 magnitude earthquake occurred in Cianjur Regency on November 21, 2022. According to the Cianjur BPBD report on December 17, 2022, 602 people died and 114,683 people were displaced, with 16 sub-districts out of 32 sub-districts affected. The Cianjur Regency Regional Disaster Management Agency (BPBD Cianjur Regency) has three stages of disaster management, namely before, during, and after a disaster, during pre-disaster, disaster emergency, and post-disaster. The distribution of relief goods during the disaster emergency phase (emergency response) where relief goods come from the West Java BPBD to three warehouses under the auspices of the Cianjur Regency BPBD, namely the Unilver Warehouse, the Bale Rancage Women's Building Warehouse, and the Cianjur BPBD Warehouse, with the location of the three warehouses located in one district, namely Cianjur District. In the process of distributing aid, speed and accuracy of service are key factors in humanitarian logistics. Therefore, response time must be considered, which refers to ambulance service time, meaning that round-trip distribution should not take more than sixty minutes. In the process of distributing relief goods there are 60.42% of affected sub-districts that have a response time of more than 60 minutes, this indicates that most sub-districts have a long distribution time so that refugees are late in receiving assistance from BPBD Cianjur. The purpose of this research is to determine the location of the new warehouse so that it can cover the refugee location points within the specified response time standards.

The MCLP method is used with the aim of maximizing warehouse coverage so that it can serve refugees or requests within a certain time limit by considering

warehouse location criteria based on disaster risk index, human development index, road density index, and the number of refugees at each affected sub-district point. In this research, the time limit used is 60 minutes where the time and in emergency response conditions (phase when a disaster occurs). The MCLP method used is a development method from the basic model, namely by adding parameters in the form of human development index, road density index, and disaster risk index. Then for the objective function of the MCLP Model used is to add a priority value. The priority value is used to prioritize warehouses that will be selected in locations that have a high number of refugees so that the results of the selected warehouses will be built in areas that are easily accessible, low risk, have good regional development, and consider locations that have a high number of refugees.

From the results with ILOG CPLEX, it is found that when P < 3 or when the selected warehouse points are less than 3, it is sufficient to cover all demand in the affected sub-district areas, the selected sub-district areas are Cibeber, Sukaluyu, and Pacet. From the results of the selected sub-districts, it is necessary to verify and validate, verification by analyzing whether the response time between the selected warehouse point and the affected sub-district point is less than 60 minutes and whether the selected warehouse point has met the threshold of the human development index, road density index, and disaster risk index so that the new warehouse location is easy to access, has a low disaster risk, and has good regional development. The verification results show that the proposed results have met all the requirements of the verification. In validation after interviews with related parties, the proposed solution is the right solution according to the bitterest stakeholders. After verification and validation of the model carried out. What is done is a comparative analysis with actual conditions and previous research, the results obtained by the solution derived from the MCLP method used by the author have an average response time of 23.34 minutes and no warehouse has a response time of more than 60 minutes.

Keywords: Humanitarian Logistics, Temporary Warehouse , Relief Warehouse

Logistics, MCLP, Cianjur Earthquake