

ABSTRACT

Reducing human suffering during and after disasters is one of the most important objectives of humanitarian aid logistics. The lack of relief supplies, especially rescue aid, is a life-threatening loss to victims and must be taken into account when making decisions on aid allocation at the pre-disaster stage. The aid allocation policy currently used is still based on assistance from BNPB, causing a minimum target of 100% to be missed for the distribution of aid to each region. This research aims to determine the independent variables that can affect the demand for aid, determine the weight of the criteria for each category in predicting aid and build a prediction model for each category of aid to improve the aid ratio. This final project proposes Factor Analysis and Multiple Linear Regression models to determine prediction weights so that the ratio between supply and demand meets the minimum target of 100%. In this case by considering several selection criteria or factors that will be used as independent variables using factor analysis. The current model still uses five variables consisting of IRBI, population, human resources, chain of control and warehouse. The use of the current model and the selection of criteria are not yet based on academic studies. Meanwhile, the fulfillment of requests for each district / city is only based on habit, and the source of logistical assistance is obtained from assistance provided from BNPB. And every year the amount of assistance and the type of logistical assistance is always different. As for the proposed model, it considers five variables such as IRBI, population, poverty level and chain of control and level of infrastructure damage. After obtaining five independent variables, factor analysis is then carried out to find out which variables affect the dependent variable, namely the aid demand variable. The results of the factor analysis show that the variable level of infrastructure damage does not meet the requirements of the ANTI IMAGE CORRELATION value so it must be eliminated because the ANTI IMAGE CORRELATION value of the variable level of infrastructure damage is only 0.197 and this value is below 0.5 so that the variable level of infrastructure damage is not strong enough and cannot be used for further research. There are several reasons for the elimination of the infrastructure

damage level variable, one of which is because the IRBI variable already includes the value of the infrastructure damage level of a district/city. The components of the IRBI value consist of hazard values calculated based on the spatial probability, frequency and magnitude of natural phenomena such as earthquakes, floods, volcanic eruptions, and others. Vulnerability is calculated based on physical and environmental parameters. Capacity is assessed using a regional resilience approach based on seven priorities. Frequency of occurrence is also not a determining factor because the value is also included in the IRBI value. Therefore, the proposed model only considers using four criteria, namely IRBI, population, poverty level and chain of control, which are obtained based on observations from several references.

There are several assumptions that must be met before using the Multiple Linear Regression model, namely by using classical assumptions. The results of using the Multiple Linear Regression prediction model obtained weights for all categories of logistical assistance, for example, ready-to-eat assistance for all independent variables, namely $Y = 37.91683878 + 0.16506246 (X1) + 0.02308284 (X2) + 0.50761581 (X3) + 0.02785308 (X4)$. After obtaining the weight for the overall assistance per category, the amount of assistance for each category will be calculated. The results obtained show that there is an increase in the ratio between supply and demand from assistance, from 51% to 103%. And has been above the minimum target limit of 100%. Using the t-test the level of difference between the current model and the proposed model has statistically significant results. One suggestion for further research is that agencies should pay attention to the weight of prediction criteria for logistical assistance.

Keywords - Humanitarian logistics, Factor Analysis, Multiple Linear Regression, Aid allocation