ABSTRACT

Natural disasters, including landslides, pose a significant threat that can disrupt livelihoods and cause substantial losses in Indonesia, especially in vulnerable regions such as Purwakarta Regency. This study aims to develop a landslide potential prediction model based on rainfall data using the Artificial Neural Network (ANN) method. The research analyzes rainfall characteristics in Purwakarta Regency and implements ANN as a predictive tool. The ANN method was chosen for its ability to recognize patterns and relationships in complex data, which are difficult to identify through conventional approaches.

In this study, rainfall data and ground movement data were used as inputs for the ANN model, with parameters including 2 neurons in the input layer, 1 hidden layer with 16 neurons, a learning rate of 0.01, 2000 epochs, and a dropout rate of 0.5. The results indicate that rainfall is a significant factor influencing the potential for landslides in Purwakarta Regency. The developed ANN model successfully predicted landslide potential with high accuracy, achieving an R^2 value of 0.8374 on the testing data, indicating that the model can explain 83.74% of the variability in new data. This research contributes significantly to landslide disaster mitigation efforts in Purwakarta Regency by utilizing artificial intelligence technology.

Keywords: Artificial Neural Network, landslide prediction, rainfall, Purwakarta Regency, disaster