

ABSTRACT

ANALYSIS OF INCREASING SOIL TEMPERATURE IN THE MOUNTAIN AREA AS A NATURAL DISASTER MITIGATION BY USING SATELLITE IMAGE DATA

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Mount Merapi is one of the active volcanoes in Indonesia which shows symptoms of the most active volcanism in the world. Included in the active volcano type A or Stratovolcano, with a primary hazard threat in the form of hot clouds (consisting of gas elements, boulders, volcanic ash) which is initiated by lava flows and lava dome collapse. While secondary hazards often occur after the eruption, namely cold lava floods. Due to its status as a very active volcano and high activity with a short eruption period between 2-7 years, it is necessary to take natural disaster mitigation measures to reduce disaster risk for people who live in disaster-prone areas. In this study, image data will be used which is divided into three conditions, namely normal, standby, and alert. Which will then be analyzed based on the brightness temperature using the modified CNN architecture and the best CNN type from the research. The purpose of this study was to analyze the brightness temperature on the surface both spatially and temporally in the crater area of Mount Merapi and determine the accuracy level of the best CNN architectural status in this study. This will make it easier for the authorities to study and know the current condition of Mount Merapi. From the results of the temporal and special analysis of the temperature anomaly, the highest brightness occurred on November 2, 2014, November 5, 2015, September 26, 2018, and September 13, 2019, namely 320,026123 K, 327,075104 K, 320.967285 K, and 331,08313 K, but there was no relationship or no relationship. with the eruption of Mount Merapi. The use of the best Convolutional Neural Network models and algorithms kernels 8, 16, 32 and ResNet101 64 in this study with a dataset that has been augmented by 2078 images with data sharing 80% training, 10% test, 10% validation getting an accuracy result of 0, 33 and 0.32. The results obtained can later be used as natural disaster mitigation in order to reduce the impact or risk of disasters for disaster-prone communities.

Keywords: *Merapi Volcano, Mitigation, Brightness Temperature, Landsat 8 Thermal Infrared Sensor (TIRS), Convolutional Neural Network*