PERINGATAN DINI DAN PENDETEKSI BENCANA BANJIR BANDANG MENGGUNAKAN METODE *FUZZY MAMDANI* BERBASIS *INTERNET OF THINGS*

Early Warning And Detection Of Flood Disaster Using The Internet-Based Internet Of Things Mamdani Fuzzy Method

I Gede Wiryawan, S.Kom., M.Kom

Muhammad Lutfi Fadilah
Study Program of Information Technology
Majoring in Information Technology
Program Studi Teknik Informatika
Jurusan Teknologi Informasi

ABSTRACT

The heavy rain that poured on Jember Regency just before the New Year's transition, specifically on Sunday, January 1, 2006, caused the Kaliputih river to overflow, resulting in a flash flood. The flood in Kemiri Village was caused by unpredictable rainfall in the upstream area and the consequences of rampant deforestation. The large pieces of wood carried by the flood served as evidence to support this statement, as well as the unpredictability of rainfall in the upstream area. Based on this problem, the researcher aims to design and develop a prototype system or device based on IoT (Internet of Things) for early warning of flash floods, utilizing the HC-SR04 ultrasonic sensor to measure river water levels and the raindrop module sensor to measure rainfall, which can be connected to a Telegram application for notifications. The methods used in this research include problem analysis, literature review, data collection, system design, system implementation, and system testing. A decision-making algorithm called Fuzzy Mamdani is added to improve the accuracy of the flood occurrence output. Based on the results of 10 conducted tests, the accuracy level of the output compared to MATLAB for determining the conditions of safe, alert, and flood reached 99.43%, indicating high accuracy with an accuracy error of 0.57%.

Keywords: Fuzzy Mamdani, IoT (Internet of Things), and flood