APPLICATION OF FUZZY LOGIC IN RAINFALL PREDICTION IN SLEMAN DISTRICT

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ABSTRACT

The background to this research is the emergence of awareness that uncertainty in rainfall can disrupt various community activities, especially traders who depend on weather conditions to run their businesses. To overcome this problem, efforts are needed as a solution to find out rainfall predictions which can help facilitate community activities. Traditional methods for determining rainfall based on direct observation have weaknesses, such as the difficulty of obtaining accurate and representative data due to the limited number of observation stations, limited locations, and delays in data collection or reporting. Therefore, this research aims to build a rainfall prediction system using the Fuzzy Logic method which has been proven effective in predicting uncertain phenomena such as rainfall. Rainfall prediction using the Fuzzy Logic method is more adaptive to uncertainty and allows integration of multi-source data for more accurate estimates than direct observation. The specific method used in this research is the Fuzzy Inference System which has three types, namely Fuzzy Tsukamoto, Fuzzy Mamdani, and Sugeno. In this research, Fuzzy Tsukamoto is used, which is known to have a high level of accuracy in predicting rainfall. This research focuses on Sleman Regency which has a lot of economic and social activities. Rainfall data from 2015 to 2022 is used in this research, with the aim of predicting monthly rainfall for 2023. The research results show that the highest monthly rainfall is predicted to occur in November, with a value reaching 803.71 mm. Meanwhile, the lowest monthly rainfall is predicted to occur in August, with a value of only 47.65 mm. This information can help the public, especially traders, to plan their activities better, anticipating the impact of high or low rainfall in certain months.

Keywords*: Rainfall, Fuzzy Logic, Tsukamoto, Sleman Regency, Prediction.*