ABSTRACT

Awareness to anticipate flood disasters is the basis for building monitoring in flood prone areas. This research continues from the previous research, which is identifying floods using height sensors. However, the sensor used in previous studies has a high price and does not measure rainfall, on the other hand rainfall is a major factor of flooding. Design a monitoring build to predict future floods by measuring river water levels and measuring rainfall. Measurement of river surface water distance is carried out using ultrasonic sensors with the equation $y = 1.0371x + 1.5184$ which has a relative uncertainty value of 0.052%. Rainfall measurement is done using a tipping-bucket sensor with a regression equation that is $y = 0.202x - 0.4768$ and the relative uncertainty value is 2.44%. The prediction is done by analyzing the effect of rainfall on the water level which will cause flooding. The system was created using internet of things technology with 85% delivery accuracy for approximately two months. The location of the study was conducted on the Cisunggalah River. The results obtained, the average height of the upstream is 40 cm and the average downstream height is 100cm in normal circumstances. an increase in the height of the Cisunggalah river causes an increase in the water level in the headwaters of the river. Rainfall that occurs in the river area causes an association of an increase in water level in the upper reaches of the river with an exponential equation of $y = 3.8396e0.0537x$. The increase in river water level in vulnerable areas can be influenced by the increase in water in tributaries and rain that occurs in the tributary areas.

Keywords: Voltage sensor, Ultrasonic sensor, Tipping bucket, Internet of things