ABSTRACT

Floods in the Citarum River, Baleendah District, Bandung Regency continue to pose a serious threat to residents who live not far from the river. Changes in extreme weather make the weather in Indonesia is so erratic and can cause significant difference of season, like longer rainy season or vice versa. For floods that occur very often, residents are not always alert and ready for future floods. Therefore, it is necessary to have an appropriate flood early warning system as well as notification information as soon as possible for residents around the Citarum River, Baleendah District, Bandung Regency in order to know about the flood potential. This flood early warning system is carried out by implementing an ultrasonic sensor based on the Arduino microcontroller and will be communicated to people in Baleendah, Sukabirus District through Short Message Service (SMS) and Internet of Things (IoT). While sensor detects flood danger, the device will send status or signal with the buzzer so that people know that there will be a flood. Then there will be information about the height of the water on the Liquid Crystal Display (LCD) screen installed on the device. The results obtained based on testing through design of flood early warning systems which is successfully implemented by integrating ultrasonic sensor with GSM Module and based on IoT. The accuracy value of the ultrasonic sensor and rainfall sensor is 98,56% and 85.45% then the relative ultrasonic error and rainfall sensor is 1,44% and 14.54%. In GSM Module testing, it gets delay value of 3,55 seconds, packet loss value of 0% and throughput value of 35bps. Whereas the IoT data transmission testing with Wi-Fi Module gets a delay value of 11 seconds, a packet loss value of 0%.

***Keywords** : Microcontroller, Ultrasonic, Liquid Crystal Display (LCD), Arduino, Buzzer, Short Message Service (SMS), Internet of Things (IoT).*