

## ABSTRACT

*The flood disaster in Indonesia has been causing a lot of damage and casualties. Starting from a broken house and the victims affected by the floods. This is caused by the lack of handling before and after flooding. Ignorance of the coming flood, caused catastrophic flooding affected many casualties. To reduce this risk, there is one way, that is by design a flood monitoring system to detect impending flood. One of technology that can be used is Wireless Sensor Networks, because this technology has a sensing function to determine the condition around and distribute them to various nodes.*

*In this study, designed a Wireless Sensor Network technology which can monitor the condition of a particular river which in this thesis, the river is assumed to be an aquarium and later used as an artificial river for flood simulation, this is done in order to test the overall system. Merging the Internet and Wireless Sensor Network will create a monitoring technology that can be done remotely by utilizing a microcontroller as brain or central data processing and data communication for data exchange between the machine and the Internet as a liaison between the server and client. The system is equipped with an Arduino Uno, HC-SR04 sensor and water flow sensor. This system can monitor the flow of water and high water level, so it can draw conclusions on safe conditions, vulnerable, and the dangers by using fuzzy logic. To obtain a good performance of the system, then the network quality testing that occurs between nodes with different scenarios. Tests conducted by the topology of a single hop and multi-hop with the parameters of delay, throughput, power consumption, time of end node to join the network, and the accuracy of the system. Multi-hop is designed with the addition of router node between the coordinator and end devices/node.*

*After some testing, this system has a maximum range without a router at a distance of 95.1 meters and 185.5 meters when using the router. Error rate sensor HC-SR04 is only 1.121485%, water flow sensor at 8.091389%, and error system at 5%. In testing for the quality of its network, throughput and end to end delay obtained fairly stable, the greater the distance the greater end-to-end delay to be, otherwise throughput getting smaller. For power consumption is only 0.083 Watt / hour when no router and 0.06525 Watt / hour when the addition of the router between the coordinator and end device.*

**Keywords: Wireless Sensor Network, Internet, Fuzzy Logic, Remote, Monitoring, Flood, Microcontroller.**