

ABSTRACT

Tidal flooding (commonly known as "rob" flooding) is a frequent disaster in coastal areas, particularly in Semarang city. The main causes are a combination of rising sea levels, land subsidence, and damaged sea defense infrastructure. To address this issue, this research develops a sea level monitoring system based on an Early Warning System (EWS) and multisensors, allowing the community to directly monitor sea level conditions, especially in Semarang. The system uses an MB7076 ultrasonic sensor and a submersible sensor to measure water level, along with supporting sensors such as the DHT22 sensor to monitor the ambient temperature where the device is installed, and a voltage sensor to measure the system's battery capacity.

This system is integrated with a monitoring website that provides real-time data every 15 minutes and sends early warnings to the community via a Telegram group when the sea reaches a critical level. Testing was conducted at the Yos Sudarso Pump House, Semarang. Tidal data was successfully recorded after four days of data collection, with the sea typically rising around midnight, reaching a maximum height of 70-80 cm. It was found that the ultrasonic sensor had an error rate of 3.09% with an accuracy of 96.98%, while the submersible sensor had an error rate of 5.9% and an accuracy of 94.1%. During the four-day test, there was a 12% packet loss due to signal interference during data transmission. The collected data is processed via Wi-Fi to be sent to the website, with GSM as a backup. Additionally, data is stored on an SD card as a log. With this system, it is hoped that the community and local government can be more alert and prepared to face the risks of tidal flooding, minimizing the impact of such disasters.

Keywords: tidal flooding, monitoring system, multisensor, early warning, IoT