ABSTRACT

As is known, natural phenomena are things that cannot be avoided by humans, especially natural anomaly. Natural anomaly can cause losses in the form of material or life. One of the natural anomaly that occur in this country is the change in sea tides. This anomaly can lead to natural disasters such as tsunamis, an example that has occurred in this country, namely the tsunami disaster in Aceh which killed around 230,000 people. With the occurrence of this disaster caused by a natural anomaly, one method is provided that can be used to reduce the impact by conveying information and warnings to the public regarding changes in the ebb and flow of sea waves, especially for people who live on the coast.

The monitoring system that will be designed is a system that can monitor wave conditions so that it knows natural phenomena that occur by conveying information in the form of sea wave height and sea wave status. This system uses TTGO LoRa to send data so that it can be monitored and the BNO055 sensor module as the main part for reading sea wave conditions, where the BNO055 sensor consists of an accelerometer, gyroscope and magnetometer to determine changes in acceleration, angular position and magnetic field, as well as integrate the three data in order to produce measurements of wave height.

This research succeeded in combining the smart sensor BNO055, Arduino Nano and TTGO LoRa to produce an error in wave height of 7.5% and an accuracy of 92.5%. The data sent has a sending time interval of 1 minute and the data sent is in the form of SNR, delay, RSSI and wave height values.

***Keywords**: Tsunami, BNO055, Arduino Nano, TTGO LoRa, Ocean Waves*