

ABSTRACT

As a maritime country, Indonesia has a much larger area of water than its land area. This could contribute to the potential production of abundant natural marine resources. However, this does not proportionally reflect the safety of fishermen. In reporting emergency conditions, fishermen often face difficulties in communicating with monitoring authorities. They frequently experience blank spots of communication. Moreover, many fishermen use random frequencies for communication, which can interfere with other frequencies. Current solutions such as AIS and satellite phones are considered ineffective for small-scale fishermen because of their relatively high cost.

Addressing these issues, this Final Project proposes a panic button system utilizing LoRaWAN technology as a communication protocol for fishermen's emergency signals while at sea. LoRaWAN enables long-range communication without relying on the internet and has a low power consumption, making it suitable for oceanic applications. Furthermore, the LoRa frequency is regulated in Indonesia, ensuring that it does not interfere with other frequencies.

Several tests were conducted in this study. Communication range testing resulted in a maximum radius of 5 km using SF10 and SF12. The transmitted information was aligned with the received information, and the monitoring authorities received alerts when the fishermen pressed the panic button. The system was also proven to be resistant to shock and water, making it safe for use at sea. The best Signal to Noise Ratio (SNR) was obtained using SF7 at a distance of 1 km with an average value of 0.5 dB. The best Received Signal Strength Indicator (RSSI) value was obtained using SF12 at a distance of 1 km with an average value of -94.661 dBm. The lowest Time on Air (ToA) value was achieved using SF7, and the lowest packet loss value was obtained using SF12. These four parameters are highly influenced by the Spreading Factor used. The testing of the end device's lifetime when not pressed lasts for 6 days, 3 hours, and 3 minutes, while when pressed, it lasts for 4 days, 15 hours, and 6 minutes. The website's performance achieved outstanding results, scoring 99 on desktop and 95 on mobile device.

Keywords: Panic Button, LoRaWAN, Fishermen, Spreading Factor.