ABSTRACT

In Indonesia, there are many individuals with Down Syndrome, including those with mobility challenges and mental health issues. This group is at a higher risk of getting lost, especially during emergencies like natural disasters or evacuations. They often struggle to protect themselves and communicate when lost.

Therefore, solutions are needed to track and identify their movements in critical situations. One promising option is a GPS tracker based on LoRa technology. This technology can reliably track locations, even in areas with weak or unstable signals. It helps parents or caregivers locate users even when they are out of reach.

The LoRa-based GPS tracker is designed to provide real-time location information, even in difficult or signal-dense terrains. Unlike regular GPS trackers that rely on cellular networks, this device uses radio frequency (RF) signals, making it more flexible and efficient. Continuous monitoring reduces the risk of losing track of users, which is especially important during emergencies.

This study aims to develop a LoRa-based GPS system as a monitoring tool capable of sending accurate location coordinates. Compared to traditional GPS trackers, which depend on cellular signals, the LoRa-based system offers a more stable connection, even in remote areas that cellular networks cannot reach.

A survey of parents found that 26 were satisfied, and 29 felt supported by using this tracking tool for their children. The device helps reduce anxiety by allowing parents to monitor their children's locations and activities in real-time, providing a sense of security and peace of mind even when the children are not under direct supervision.

Key Word: Down Syndrome, GPS Tracker, LoRa