Relay Station Network Based on Low-power Wide-area Network (LPWAN) Technologies for Disaster Management

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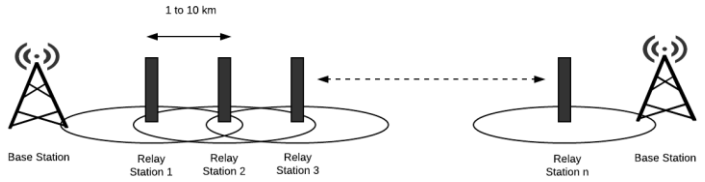
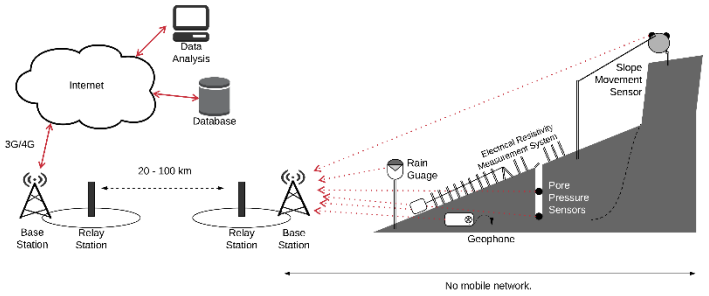
Natural disasters often cause significant disruption in public utilities and services. The loss of communication network is especially vital when the disasters are taking place because data under those situations are crucial either for analytics or strategic planning, such as rescue or evacuation.

Thus, a backup telecommunication channel is mandatory in this case. For some disasters, such as landslides or flash floods, where their triggers could be monitored in mountainous or rural areas quite far away from towns and where the electricity from the power line is not an option, a low-power and long-range communication channel is required as well.

Therefore, in this project, we propose a relay station network as a solution to such situations. The relay station network consists of an array of relay stations that their only function is to forward the received data to the next station until the data reach the destination (base) station. As for the realization of the proposed system, we will show how to apply it into two applications: the landslide monitoring system and the intelligent remote monitoring system for dam safety.



Structure of the proposed, LPWAN-based relay station network.



Example of using the proposed relay network with a real-time monitoring system.

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