ABSTRACT

According to recent surveys, approximately 64.15% of fatalities are attributed to natural calamities, with landslides emerging as a predominant cause. The increasing rate of fatalities due to landslides has been linked to the inefficiency and unreliability of current prediction systems, which are often time-consuming and fail to provide timely alerts. To mitigate the severe consequences of landslides, it is essential to develop efficient, accurate, and rapid prediction mechanisms.

A review of existing literature reveals that the majority of landslide prediction approaches rely on sensor-based technologies. Among these, the WSN stands out as the most widely adopted technology due to its capability to provide large-scale, real-time environmental monitoring. WSNs consist of spatially distributed sensors that collect critical data—such as soil moisture, ground movement, rainfall, and vibrations—which are vital for predicting the likelihood of a landslide.

Once data is gathered and processed, if the system detects a high probability of landslide occurrence, an early warning or alert is sent to the respective disaster management authorities. This enables timely evacuation and implementation of preventive measures, thereby significantly reducing the risk to human life and property. This project aims to comprehensively examine and compare these diverse techniques, with a focus on their effectiveness in minimizing fatalities and improving early warning systems. The goal is to identify and promote the adoption of optimal technologies that can support proactive disaster management and risk mitigation strategies.