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Monitoring of Landslides in Mountainous Regions based on FEM Modelling and Rain Gauge Measurements

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Abstract

Vietnam is a country heavily influenced by climate change. The effect of climate change leads to a series of dangerous phenomena, such as landslides. Landslides occur not only in the mountainous province, but also in Delta provinces, where hundreds of landslides are reported annually in the North-Western provinces of Vietnam. These events have catastrophic impact to the community as well as the economy. In mountainous areas, the conditions for landslides to occur are met frequently, especially after heavy rains or geological activity, causing harm to the community as well as damaging or destroying much needed infrastructure and key transport routes. However, in Vietnam, investment in mountainous regions has been often lower than in urban areas. The meteorology monitoring and forecasting systems are ill equipped and overloaded, so they cannot deliver earlier and more accurate forecasts for complex weather events, unable to provide timely warnings. It can be seen that in countries that landslide often occur, researchers have been trying to develop low cost and efficient landslide detection system. This paper precisely addressed the problems mentioned, by designing and implementing an efficient and reliable Landslide Monitoring and Early Warning (LMnE) system based on the 3G/2G mobile communication system, and a rain gauge at the field site along with a carefully FEM (finite element method) simulation using the rain density information on the server. The system uses advanced processing algorithms combining obtained data at the central station.

Keywords

Landslide; Monitoring; Modelling; Rain induced; Slope stability

Refbacks

• There are currently no refbacks.