

ABSTRACT

Landslides are a major geohazard causing significant loss of life and property. Identifying areas susceptible to landslides is crucial for mitigation strategies. This study investigates the potential of sentinel – 1 data and Interferometric Synthetic Aperture Radar (InSAR) technique for monitoring and prediction of landslides. The proposed method is used to analyse the Tupul landslide in Manipur, India, which occurred on June 30, 2022.

An early detection of a potential landslide zone is critical for implementing mitigation measuring and reducing risks. For this the InSAR technique that exploits phase differences in radar signals to measure small surface displacements. Sentinel – 1 part of a series of satellites offering frequent revisit times and wide area coverage, making it suitable for monitoring large area susceptible to landslides.

The Sentinel – 1 InSAR-based displacement time series analysis for years 2017, 2020, and 2022 reveals that the areas around the slip surface shows displacement patterns over the period of time. The stress stated building in the year 2017, in the year 2020 the displacement is scattered in the lower or the foot region of the AOI, in 2022 the stressed region slipped in the form of landslide causing massive disruption in communication as national highway was shut down due to its condition post landslide.