Earth Observation Based mapping, Monitoring and Modelling of Landslide: Recent trends and support to early warning system

Workshop Coordinator/s: Dr. S.L. Chattoraj/GSD/GDMS

Duration: 1day/ April 21, 2021

Scheme of course:

Lectures: 4 lectures and Panel Discussion (1 hr each) + one GL (45 Mins)

Schedule: Attached

Description:

Landslides are a frequently occurring natural as well as man-made hazard in the mountainous terrains owing to a wide variety of causative as well as triggering factors like heavy rainstorms, cloudbursts, earthquakes, geo-engineering setting and anthropogenic activities. In the Himalayan and Sahadri mountainous region, landslides are mostly rainfall triggered and although they are individually small in dimension but occur with a high frequency and cause substantial damage to life and property. In recent years, multiple remote sensing techniques from spaceborne, airborne, and ground-based platforms, have been widely applied for the monitoring of landslide processes. Current techniques include landslide classification, detection, digital elevation model reconstruction, surface deformation monitoring, and volume/mechanism inversion. In addition, landslide susceptibility mapping, hazard assessment, and risk evaluation can be further analyzed using a synergic fusion of multiple remote sensing data and other observations affecting landslides. Comprehensive assessment of landslide hazard which requires process based modeling using numerical simulation methods is in a budding stage in India. Precipitation triggered landslide models have been attempted in similar tectonically disturbed regions. Thus the national imperative towards safety due to landslide initiation is increasing in view of the higher rate of human settlement in the mountain slope across the country. A landslide early-warning system is envisaged as a system capable of modelling landslide occurrences and provide timely advance warning about the impending danger. It can be for an individual landslide where warning is based on movement sensors or for small areas for one or more landslides where warning is based on rainfall threshold or for a very large area using weather prediction. In order to develop a reliable LEWS, the processes leading to mass movement need to be understood and quantitatively measured for its spatial variation and temporal prediction. Snow avalanches are a well-known hazard type and are defied as a sudden release of snow masses and ice on slopes, sometimes, containing portion of rocks, soil and vegetation. Snow avalanches also can pose a risk o persons, buildings and infrastructure in mountainous regions. In Indian context, the state of Uttarakhand has emerged as the hot-spot of landslide disasters. In this context, the proposed workshop is envisaged to showcase advancements made in mapping, monitoring and modelling aspects of landslide and deliberate on the support to development of early warning system.