

Discussion of landslide issue in Ampang closely related to remote sensing

As stated in the newspaper display, Ministry of Science, Technology and Innovation (MOSTI) stated that they will assist the government and Natural Disaster Management Agency (NADMA) in dealing with the risk of landslides in the country. This can be done with information and analysis of remote sensing technology developed by Malaysia Space Agency (MYSA). Deputy Minister of Science Technology and Innovation, Datuk Ahmad Amzad Hashim said, seven types of information related to remote sensing and satellite images can provide initial information related to land movement as well as help address landslide-related risks. It was also rumoured in the newspaper clipping that MOSTI had collaborated with Ampang Jaya Municipal Council (MPAJ) through the 'E-Slope' system which helped with slope development.

Landslide study using remote sensing

Several remote sensing data have been used to study landslide processes, including space-borne synthetic aperture radar (SAR) and optical remote sensing, airborne light detection and ranging (LiDAR), ground-based SAR and terrestrial LiDAR.

- SAR data have been widely used in landslide research because of their broad coverage and high spatial resolution and the ability to operate under all weather conditions. Satellite SAR data used include archived ERS and Envisat ASAR, ALOS/PALSAR, COSMO-SkyMed constellation, TerraSAR-X, TerraSAR-X/TanDEM-X and Sentinel-1 and Envisat 2010.
- Optical remote sensing images were mainly applied to generate landslide inventory, considering long time-series of Landsat TM/ETM, SPOT 1–5, ASTER, IRS-1C LISS III, and RapidEye between 1986 and 2016. The ZY-3, and GF-1 high spatial resolution satellite images were used to investigate the landslide cinematics with an image correlation algorithm to SPOT-5 images.
- Multi-temporal LiDAR images and ortho-photos can be compared to quantify landscape changes caused by an active landslide. The ground-based terrestrial laser scanner (TLS) LiDAR can produce highly detailed three-dimensional (3D) images within minutes, allowing the study of 3D surface changes of landslides.

Among the most useful applications derived from the analysis of remote sensing images is the development of digital terrain models (DEMs), such as those generated from Indian remote

sensing satellite (IRS) P5 images and TerraSAR-X/TanDEM-X images by InSAR. DEM can then be used to assess erosion, landslide, and topographic multi-temporal differences (L. Ray et al., 2020).

REFERENCE

- L. Ray, R., Lazzari, M., & Olutimehin, T. (2020). Remote Sensing Approaches and Related Techniques to Map and Study Landslides. In *Landslides - Investigation and Monitoring*. IntechOpen. <https://doi.org/10.5772/intechopen.93681>