Landslide Hazard Detection Using ALOS/PALSAR DInSAR Technique: Study Case Kayangan Catchment Area, Yogyakarta, Indonesia

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Abstract

Disaster, both natural and man-made, are increasing in their frequency and catastrophic impact in Indonesia. The Japanese L-Band SAR sensors satellite data (ALOS PALSAR) has ability to monitoring disaster and measure any changes occurred on earth surface. The method used in this research is Differential Synthetic Aperture Radar Interferometry (DInSAR). DInSAR is a technique useful for accurately detecting the ground displacement or land deformation in the antenna line-of-sight (slant-range) direction using synthetic aperture radar (SAR) data taken at two separate acquisition times. The D-InSAR method is complementary to ground-based methods such as leveling and global positioning system (GPS) measurements, yielding information in a wide coverage area even when the area is inaccessible. The landslide map is generated over each area according to the DInSAR result. Our analysis reveals that Kayangan catchment areas exhibit clear indications of slight movement in study area. The analysis of land deformation approved to assess the acceleration caused by a destabilizing anthropogenic change, and the relationship among seasonal precipitation and deformation variability.

Keywords: Monitoring, Landslide, ALOS PALSAR, DInSAR.