

Shallow Landslide Susceptibility Mapping Using High-resolution Topography for Areas Devastated by Super Typhoon Haiyan

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Super Typhoon Haiyan, considered as one of the most powerful storms recorded in 2013, devastated the central Philippines region on 8 November 2013 with damage amounting to more than USD 2 billion. Hardest hit are the provinces of Leyte and Samar. Rehabilitation of the areas that were devastated requires detailed hazard maps as a basis for well-planned reconstruction. Along with severe wind, storm surge, and flood hazard maps, detailed landslide susceptibility maps for the cities and municipalities of Leyte (7,246.7 sq. km) and Samar (13,121 sq. km) provinces are necessary. In order to rapidly assess and delineate areas susceptible to rainfall-induced shallow landslides, Stability INdex MAPping (SINMAP) software was used over a 5-meter Interferometric Synthetic Aperture Radar (IFSAR)-derived digital terrain model (DTM) grid. Topographic, soil-strength and hydrologic parameters were used for each pixel of a given DTM grid to compute for the corresponding factor of safety. The landslide maps generated using SINMAP are highly consistent with the landslide inventory derived from high-resolution satellite imagery from 2003 to 2013. The methodology addresses the need for rapidly generated shallow landslide susceptibility maps and detailed landslide susceptibility classification which is useful to identify safe and unsafe areas for reconstruction and rehabilitation efforts. These shallow landslide susceptibility maps have been made freely available to different relief and rehabilitation agencies in Typhoon Haiyan ravaged areas. These maps complement the debris flow and structurally-controlled landslide hazard maps that are also being prepared for rebuilding Haiyan's devastated areas.

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