

# Geospatial Tools for Landslide Susceptibility Assessment: A Case Study in Lombok, Indonesia

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## Abstract

Landslide hazard data do not only need to be studied and evaluated, but also need the proper tool to quantitatively assess hazards, systematically manages the diverse and detailed information, provide a high efficiency and improve the quality of the final results. Geospatial tools have been developed to cope with these issues to ensure the optimal conduct of Landslide Susceptibility Assessment (LSA). A database application called 'LIDIA' (Landslide Inventory Database Indonesia) is a landslide inventory which provides a framework and tools for displaying and analyzing landslide information. Existing information on landslides are collected in a spatially aware digital format. LIDIA application has been designed to be integrated into a Geographic Information System (GIS) environment, traceably to visualize and present the data. The ArcGIS-Toolbox 'Landslide Susceptibility Assessment Tools 1.0' is an automatize 'standard processes' in GIS aided generation and validation of landslide susceptibility maps. The Toolbox is subject to continuously developing and actually contains tools for calculation of deterministic and bivariate statistical models as well as a tool for validation. These geospatial tools are in-house development of the Federal Institute for Geosciences and Natural Resources (BGR) and were tested within the Georisk-Project and Geological Agency of Indonesia. The landslide inventory stored in LIDIA captured 218 landslide events in Lombok. The toolbox was tested to generate the landslide susceptibility map of Lombok. Validation tool was successfully applied to assess the quality of the model as well as to compare the susceptibility maps of Lombok created by different methods. These tools provide an improvement in landslide susceptibility assessment methodology through remote sensing-based in Indonesia.

*Keywords: geospatial, landslide, inventory, ArcGIS, Lombok*