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Development of Three-Dimensional Soil Water Dynamic Flow (3D SWD FLOW) Data Model for Landslide Modelling



Siti Nurbaidzuri Reli, Izham Mohamad Yusoff, Muhamad Uznir Ujang, and Tharshini Murthy

1 Introduction

Analysis using 3D geospatial models in landslide studies allows for patterning a more likely landslide displacement of soils, which enhances the precision of determining the stability of soil masses. 3D models may better portray displacement planes, lines of landslide fissures, separation walls, protrusion ramparts, and landslide terraces within the developing cirque than 2D flat models [15]. The prediction accuracy of Landslide Susceptibility is significantly enhanced by the addition of spatial attributes to the 3D Model [27]. However, three dimensional geospatial models in landslide research are receiving less attention than other environment-related studies because of the complicated integration of geotechnical and hydrological processes [45]. Due to the challenge of combining a dynamic process with a computational framework, the existing model mostly isolates material failure from propagation [48]. Due to computational efficiency and deformation and flow representation issues, it is still challenging to conduct 3D analysis of the entire landslide process in an integrated way, despite the development of numerous numerical methods to predict landslip occurrence and the extent of sediment flow [51]. Studies of landslides must take into account perspectives and theories in geology (slope material, soil strength) and

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