

IMPACT OF LAND USE/LAND COVER CHANGES ON LANDSLIDES: CASE STUDY IN KEGALLE DISTRICT, SRI LANKA

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This study evaluated the impact of land use/land cover (LULC) changes from 2014 to 2023 on landslide occurrences in *Kegalle* district, Sri Lanka. Land use/land cover distribution patterns were assessed by comparing thematic maps from 2014 to 2023 and created using the supervised classification of Landsat 8 imagery in Google Earth Engine. Map accuracy was verified through visual interpretation in Google Earth Pro, referencing each specific year. Landslide data from the National Building Research Organization (NBRO) was integrated to map spatial landslide distributions. Then, the overlay analysis in GIS was used to identify landslide-prone areas and their corresponding LULC types. The spatial analysis revealed a strong relationship between LULC change and landslide occurrences. According to the results, the forested areas and paddy lands declined by more than 3% and 4%, respectively, while built-up and upland cultivation areas increased by over 2% and 5%, respectively indicating urbanization and agricultural expansion. Landslide occurrences in cultivation areas rose from 63% in 2014 to 68% in 2023. Also, landslides in built-up areas rose from 14% to 18%. However, landslide incidents in paddy and forested areas decreased, from 11% to 3% and 11% to 9%, respectively. These results highlight that an increased landslide risk is associated with the expanded cultivation and urban areas, while the reduction in incidents is within paddy and forested areas. The results revealed that the vegetative cover may reduce the risk of landslide occurrence in the study area. This study further emphasizes the necessity of strategic land use planning to manage landslide risks driven by ongoing LULC changes.

Keywords: Geographic Information System, Google Earth Engine, Landslide occurrences, Land use planning, Spatial analysis