A Framework for Assessing the Spatial Distribution of Vulnerability of Communities to Landslides in Tropical Mountainous Region: A Case study from Kegalle District –Sri Lanka.

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Landslide vulnerability refers to the degree of loss to a given element at risk due to the occurrence of a landslide event. The concept of vulnerability is difficult to quantify due to the involvement of some social and physical indicators to determine vulnerability to a landslide in a given location. Therefore, limited research has been carried out to determine the spatial distribution of landslide vulnerability. This study attempt to map the spatial distribution of vulnerability to landslide using vulnerability index developed by entropy method abstracting information from fourteen indicators. The study was based on primary sources of data, obtained from 402 elements including associated human capital from Kegalle District-Sri Lanka. Then the Entropy method was used to estimate the level of vulnerability in sample locations (elements). Computed vulnerably vales were imported into Geodatabase which was used to evaluate element at vulnerability and map the spatial distribution of vulnerability. The spatial distribution of vulnerability was obtained from interpolating vulnerability values of sample locations (elements) by using Kriging interpolation method. Results were expressed on maps on which different spatial patterns of levels of vulnerability were found for the study area. According to the map, landslide vulnerabilities in the study area demonstrate notable regional specification. In general, vulnerability reflects expected degree of damage to the considered element or location by the adjacent to occurred landslides. Also, the spatial distribution of vulnerability has shown a close relationship with the rural-urban divide. According to landslide vulnerability analyses, 14.6% (247 sq Km) of the entire area is found to be the highest vulnerable zone for a landslide.

Further, 32% (544 sq Km) of the total land area categorized under very high or high vulnerable zones. Moderately vulnerable zones take part 13.4% (227 sq Km) of the total area. However, 26.4% (448 sq Km) of land area categorized as low or very low vulnerability, while 13.4% (227 sq Km) area categorize under the lowest zone it can be concluding that entropy method has a sufficient level of capacity to defined weigh for indicators which use for vulnerability assessment

Keywords: Element at risk , Entropy method, Spatial distribution, Vulnerability