

## **Rainfall Trends and Landslide Vulnerability: A Case Study of Badulla District**

S. Somasiri, and S. Koswatte\*

*Department of Remote Sensing and GIS, Faculty of Geomatics, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka*

*\*koswatte@gmail.com*

The climate in Sri Lanka is tropical, and consists of various characteristics during dry and wet seasons. Landslides have become a major natural disaster in the country especially in Badulla District. The purpose of this study was to identify the correlation between rainfall and vulnerability for landslides in Badulla District which is very vulnerable for landslides according to the past evidences. Geographic Information System (GIS) based Analytical Hierarchical Process (AHP) and Weighted Overlay techniques were used in this process. The AHP technique was used in determining the relative importance of the selected criteria i.e., rainfall, slope, aspect, land use, lithology, population density and the distances from drainage, roads and pre occurred landslide. All annual rainfall data were considered and averaged into the four seasons identified in the study. The relationship between annual rainfall distribution and annual landslide occurrences were studied. Moreover, the relationship between monthly rainfall distribution and monthly landslide occurrences were also studied. The correlation between landslide vulnerability and rainfall was statistically significant. This research predicted the rainfall for the years 2021 and 2022 along with the landslide vulnerability for the same duration. These findings may be very useful for general public as well as disaster management related authorities in their decision making and other activities.

**Keywords:** *Landslide vulnerability, Disaster management, GIS, AHP, Rainfall trends*