

A STUDY FOR CALCULATION OF EFFECTIVE RAINFALL THRESHOLD VALUES FOR THE INITIATION OF LANDSLIDES IN SEVERAL DIVISIONAL SECRETARIATS IN KALUTARA DISTRICT, SRI LANKA

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Landslide is one of the major natural hazards experienced in Kalutara District and it has been triggered by intense and cumulative rainfall. Because of these destructive incident, huge economical and human losses have been reported in six divisional secretariats of Kaluthara district annually. They are, Bulathsinhala, Palindanuwara, Baduraliya, Agalawatta, Walallavita, Ingiriya and Mathugama. In 1984, 2003, 2014 and 2017 years, the catastrophic landslides have been recorded in these areas. Rainfall forecasting and early warning are the most effective non-structural risk reduction methodologies used in many countries, even presently in Sri Lanka.

In accordance with the geology, morphology, sub-surface condition, soil condition, hydrology and other terrain factors, the threshold limits of the rainfall to cause mass movements can be varied. This study focused to calculate the rainfall threshold limits for the initiation of landslides in the above-mentioned divisional secretariats in Kalutara district.

Rainfall records were obtained from the automated rain gauge system of the National Building Research Organization (NBRO) and the manual rain gauge records for about 15 major landslides and about 25 minor slope failures, which were occurred in the above-mentioned years and then localized average rainfall threshold values for the above-mentioned divisional secretariats were determined separately.

Based on the results obtained from the analysis, the rainfall thresholds proposed for each divisional secretariat are as Bulathsinhala – 220 mm/day, Palindanuwara – 200 mm/day, Agalawatta - 160 mm/day, Walallavita – 150 mm/day, Ingiriya – 220 mm/day and Mathugama – 250 mm/day. An early warning system can be developed based on this approach to disseminate warnings to the vulnerable communities in respective areas and should be practiced for the entire country.

Keywords: Landslides, Intense and cumulative rainfall, Rainfall thresholds, Early warning
