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The Role of Antecedent Rainfall on the Activation of Landslides in Tegucigalpa, Honduras

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The urban population of Honduras' capital city, Tegucigalpa, is at risk of landslides every year during the rainy season. Tropical storms and hurricanes have brought about moderate rainfalls that, in conjunction with the high degree of saturation of the soils in the area, have been the cause of major landslides in the past three decades. In contrast, there have been intense rainfalls that have been capable of causing erosion but no major slope failures have been triggered. In this paper, a seepage program is used to simulate the pore pressure behavior in response to a six-day rainfall period for three different case studies. The susceptibility to failure for each case study is analyzed by means of a slope stability program. It is shown that during the first five days, the antecedent rainfall may lead to a significant reduction of the shear strength and that its influence on the activation of landslides is as important as the intensity of the triggering rainfall of the sixth day.