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# Effects of Different Rainfalls on Run-out Distances and Affected Areas of Debris Flow

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Taiwan locates at the junction of plate tectonic boundaries with active geologically condition, which results in steep terrains and fragile geological conditions. The heavy rainfall carried by typhoons often causes severe hazard of landslide and debris flow. After Typhoon Morakot, 2009, it was found that the volume of debris transported by the triggered debris flow and its effects on the affected area were much more significant compared to previous case history due to the very large amount of rainfall carried by the Typhoon. In this study, field investigations of 21 debris flow torrents with events triggered by Typhoon Morakot, 2009, were conducted, and the database of debris deposition volume and run-out distance was established. Additional dataset of debris deposition volume and run out distance of debris flow triggered by different typhoons were also collected. Comparisons of the debris deposition volumes by Typhoon Morakot and other typhoons suggested that the high precipitation of Typhoon Morakot caused larger volume of debris transportation. Statistical analysis was performed to determine the correlation of run-out distance and watershed properties. The results suggest that the correlation based on Typhoon Morakot would tend to over-estimate the possible run-out distance of the affected area in most other precipitation condition. Based on the regression analysis of dataset, regression formula of Typhoon Morakot with 50% and 70% of data distribution coverage can be used for determining run-out distance for delineating the affected area, which corresponds to medium and heavy precipitation conditions, respectively. The proposed delineation procedures for the debris flow affected area provide helpful tool for developing delineation map of potential debris flow torrent under effects of different predicted rainfall.