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應用 TRIGRS 程式於邊坡破壞機率分析-以奧萬大地區為例

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摘　要　本研究應用 TRIGRS 程式，模擬奧萬大地區受到 2008 年辛樂克颱風豪雨襲擊時對邊坡穩定性之影響，探討其破壞機率。為增加模擬之可靠度，採用地形指數推估土壤厚度與初始入滲率，並配合現地勘查與遙測資料進行分區，使參數之假設可較符合現況。本研究以破壞機率來描述邊坡之穩定性，使用 Rosenblueth 點估法來考量強度參數變異性。研究結果指出奧萬大地區風化板岩透水性佳，邊坡穩定受零星降雨影響有限，且累積降雨量與崩塌面積並非完全成正比。陡峭區域受到少量降雨其破壞機率即會昇高；較緩的邊坡必須有充足之雨量，破壞機率才會明顯的昇高。對於 TRIGRS 程式於奧萬大之崩塌源頭區之應用，本研究分析所得崩塌區位與實際崩塌區位之比對良好。以 TRIGRS 評估邊坡之穩定性，在不符合無限邊坡條件的區位，其評估結果有較大的誤差。

關鍵詞：TRIGRS、破壞機率、奧萬大、辛樂克颱風。

An Application of TRIGRS on Slope Failure Probability Analyses - A Case Study of Aowanda

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ABSTRACT　This study applied the TRIGRS code to simulate the slope stability of the Aowanda area under heavy rainfall during Typhoon Sinlaku in 2008. To increase simulation reliability, this study adopted the topography index to estimate soil thickness and initial infiltration rate. In addition, zonation for analysis was made according to the field investigation and remote sensing data for better assuming the simulation parameters relating to the in-situ condition. This study used the Rosenblueth point estimate method to evaluate the failure probability with considering variances of the parameters. The permeability is high in the weathered slate formation of Aowanda. Slope stability is less influenced by scattering rainfalls. The cumulative rainfall and the landslide area are not necessary proportional. For steep slopes, the failure probability will increase, even with only average rainfall. In contrast, for gentle slopes, the failure probability will gradually increase only after a significant amount of rainfall. The comparison between the calculated and actual landslide area is satisfied using TRIGRS for the landslide source areas of Aowanda. If the slopes do not fulfill the infinite slope assumption when applying TRIGRS for landslide evaluation, more deviated results could occur.

Key Words:　TRIGRS, failure probability, Aowanda, Typhoon Sinlaku.

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