

## 坡地易損性曲線應用於崩塌警戒模式之研究

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**摘 要** 坡地易損性曲線表達坡地在某降雨條件下引致崩塌發生之機率（可能性）。本研究以旗山流域為例，基於莫拉克事件前後期衛星影像判釋得到之事件崩塌地資訊，利用網格集群最大概似法估計不同流域之坡地易損性參數，並將坡地易損性分析結果應用於坡地之崩塌警戒評估。本研究所發展之坡地易損性曲線，考量坡度、植生、距河道遠近等不同因子組合下之坡地分類，建立不同雨量因子（小時降雨強度和前段降雨）下之崩塌發生機率關係。在崩塌警戒模式方面，本研究以坡面單元發展聚落管理單元之劃定方法，並應用坡地易損性曲線建立聚落管理單元之崩塌警戒評估模式。研究結果顯示坡地易損性曲線能夠合理地描述集水區流域之崩塌特性，並可有效地應用於坡地崩塌警戒評估。

**關鍵詞**：崩塌、坡地易損性曲線、雨量因子、警戒評估。

### Application of Fragility Curves on the Landslide Warning Criteria

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**ABSTRACT** The landslide fragility curves of this study represent the probability of landslide induced by rainfall. In the study, the remote sensing data from SPOT images were applied to analyze the landslide ratio and vegetation conditions at the Chi-Shan Watershed in Taiwan during Typhoon Morakot. The Grid-based Clustering Maximum Likelihood Estimate (GC-MLE) was conducted to determine the fragility parameters and develop fragility curves. The landslide fragility curves were applied in determining the warning criteria of landslide. In the study, different topographic factors (slope level, vegetation condition, and distance from riverway) were considered to construct landslide probability relationships with different rainfall indices (rainfall intensity and preceding rainfall). In terms of landslide warning criteria, the study used the slope unit as the basis to determine the management units of villages, and used the landslide fragility parameters to determine the rainfall criteria. The results showed that the landslide fragility curves can reasonably describe the slope characteristics of the watershed, and can be effectively applied in the assessment of landslide warning criteria.

**Key Words:** landslides, fragility curves, rainfall index, landslide warning criteria.

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