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論文名稱: 九九峰震災崩塌地植生復育之評估

英文論文名稱: Assessment of Vegetation Recovery for the Ninety-nine Peak Landslides Caused by Earthquake

【中文摘要】

集集大地震造成臺灣中部山區多處崩塌，衛星影像判釋顯示地震後新增崩塌地以南投縣九九峰規模最大；震災後新增崩塌地面積約 908.96 公頃，其後續之復育及防災等工作極為重要。本研究旨在利用地震前後之 SPOT 衛星影像計算崩塌區位之常態化差異植生指標(NDVI)，經線性反向處理成植生覆蓋指數(C)，量化崩塌區位及其植生復育情形，最後結合數位地形分析，以萃取植生復育區位之資訊，可作為崩塌地監測與治理評估之參考與依據。分析結果指出九九峰崩塌區位之分佈受到地震搖動方向之影響，以東北、北、西北及西坡向之崩壞比率較高；崩塌區位多位於坡度大於 55%的陡坡。以植生復育率量化探討崩塌區位植生復育情形，顯示九九峰崩塌區位在歷經 921 震災一年後，在自然演替狀態下其植生復育率已大於 40%，是否有必要投入大量人力與物力，從事植生復育工作，值得繼續觀察與探討。

坡面植生覆蓋之變化，可反映集水區之泥砂產量，若以泥砂產量為集水區崩塌地治理優先順序之指標，編號 4、6、8 及 12 號等集水區，因其於地震後坡面沖蝕明顯增大，宜列為優先治理之對象。試區崩塌區位分析結果，

顯示 921 地震所誘發之崩塌地多位於坡頂，以遞移率之觀點而言，植生復育區位應以河道之濱水帶為主，利用濱水區植生緩衝帶之建置可有效攔阻泥砂進入河道，能達經濟防災之目的。

【英文摘要】

Large-scale landslides, caused by the catastrophic 921 earthquake, occurred at the Ninety-nine Peaks of Wu-Chi basin. Areas of denudation are estimated to 908.96ha and are urgent to be restored for the secondary disaster prevention in the rainy season. Satellite images and digital terrain models were used to process the vegetation index analysis for identifying landslide sites and to extract topographic information of the areas. A system coupled with GIS developed in this research could be used to monitor and/or assess the recovery rate of vegetation for the landslides.

The distribution of landslides is obviously affected by the direction of quake’s shaking, the most distribution of landslides are located at the range of aspect from northeast to west counterclockwise and in the steep slopes (greater than 55%). Results show that after a year of 921 earthquake, the average rate of vegetation recovery for the landslides in the Ninety-nine peak areas is over 40% under the circumstance of natural succession. It’s worth to observe and discuss if we need to throw massive human and material resources into the vegetation recovery of the landslides.

Large amounts of sediment yield usually derived from the lack of vegetative coverage of the slopelands in a watershed, hence sediment yield can be the index of priority for the watershed management. Watershed #4, #6, #8, and #12 with the considerable amount of erosion depth should be list at the high rank of treatment priority. The sites of summit are susceptible to landslide due to the quake. From the viewpoint of sediment delivery ratio, the riparian zones are the suitable places for landslide revegetation to decrease the sediment yield and control disaster economically.