

## 花東縱谷北段的土石流扇和土石流溪溝的認定

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**摘 要** 本島土石流作用顯著，為減低災害衝擊，詳查土石流作用留下的地形痕跡，判別出哪些溪溝具有發生土石流的體質，實為重要工作。土石流扇是沖積扇（廣義）的一種，國際許多研究探討土石流扇和其他類型沖積扇之成扇物質、扇形和優勢作用、流域特性的差異。惟本島中低海拔山區沖積扇的露頭難尋，很難僅根據沈積物特徵判定一沖積扇是否由土石流作用主導。所以，本文以花蓮溪縱谷段為研究區，首先根據沖積扇形態特徵分類，再結合流域特性和成扇優勢作用的關係，進行扇型類別的判別分析，並輔以扇體沈積物特性和土石流發生記錄，判斷各沖積扇的成扇優勢作用。

研究結果顯示，採用數值航測系統判釋航照立體像對，是辨認沖積扇體很有效的方法，本研究從二百條以上溪溝中共認出 39 個沖積扇，並判定其中 34 個的成扇優勢作用是土石流。經比較土石流扇所在溪溝和已公告之土石流潛勢溪流，本文建議：採用更高精度的圖像資料，逐一判讀各溪溝，若其谷口有土石流扇或其他土石流作用過的特徵地形，則不論谷口有無保全對象，主管機關都應該加以登錄，以避免不當的開發利用。

**關鍵詞：**土石流、沖積扇、數值航測系統、花東縱谷。

## Recognition of Debris Flow-Dominated Fans and Debris Flow-Dominated Gullies in the Northern Longitudinal Valley, Eastern Taiwan

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**ABSTRACT** The debris flow process occurs around mountainous area in Taiwan. Identifying debris-flow gullies is helpful to mitigating their hazard impacts, and one approach is to recognize the characteristic landforms formed by debris flows, for example, debris flow fans. Lack of outcrops because of good vegetation cover and anthropogenic modification of the fans, however, has prevented recognizing debris flow fans from alluvial fans by examining their sediment faces. Instead, based on the relationship between the dominant fan-forming process and the catchment

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morphology, discriminate analysis, with fan sediments and debris flow hazard records, was adopted to discover fan types in this research. More than two hundred streams and gullies, draining from west to the Hualien River in the northern Longitudinal Valley, were examined. Results show the digital aerial photography is a good tool in interpreting alluvial fans. Among the 39 alluvial fans, 34 fans were categorized as debris flow dominated fans. The disparity between debris-flow-fan gullies, classified by the current research, and those debris-flow gullies classified by the authority with a different approach suggests the need to re-examine individual streams and gullies island-wide. It is strongly suggested for those debris-flow-fan streams and gullies, whether the fans are reclaimed or not, authorities should prevent further inappropriate development.

**Key Words:** debris flow, alluvial fan, digital aerial photography, Longitudinal Valley.