

高屏溪上游地區地形地質對河床土砂之影響分析

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摘 要 河相改變其與水流量與河川搬運能力及泥砂供給量關係密切。本研究以土砂平衡關係推導出土砂生產指標 (I_p) 及土砂堆積搬運指標 (I_R)，以台灣南部高屏溪流域為對象，選用莫拉克颱風 (2009) 以及凡那比颱風 (2010) 就集水區之土砂搬運、堆積及平衡進行探討。本研究於兩項指標中分別選用不同因子圖層，其中包括地形因子 (坡度、坡型、河道寬度及坡度、河岸坡度、摩擦角)、雨量因子與崩塌比，再利用 GIS 軟體之分析功能配合多變量分析方法進行上述之影響分析。結果發現，莫拉克颱風於集水區內造成的大量土砂堆積，至兩年後凡那比颱風時有漸漸往中下游運移之趨勢，表示土砂運移堆積情形也已漸達平衡。堆積仍然嚴重地區，需考慮人為治理或清疏方式解決土砂堆積之問題，否則再一次颱風或暴雨事件，皆可能造成二次災害。

關鍵詞：地理資訊系統、土砂生產、土砂堆積運移、影響因子分析。

The Influence of Topography and Geology on Sedimentation in the Upstream Area of Kao-Ping Catchment

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ABSTRACT The transportation and production of sediments are closely related to changes in river morphology. Based on the balance of sediments, this study establishes two major indexes, the sediment generation index I_p and the sedimentation transportation index I_R . In this study, we examined the impact of Typhoon Morakot and Typhoon Fanapi on the generation and transportation of sediment in Kao-Ping River in southern Taiwan. For both indexes, we selected a number of control factors, such as topography, rainfall, river morphology, landslide, etc., for the GIS multi-variable analyses. The results revealed a huge amount of sediment generated and accumulated during Typhoon Morakot. For Typhoon Fanapi two years later, it suggests sediment accumulation is limited at the downstream areas and the transportation of sediment is becoming more balanced. However, there are still tremendous amounts of sediment in the river banks that possess hazard potential and need to be treated.

Key Words : GIS, sediments generation, sedimentation transportation, control factor analysis.

一、前 言

河相改變是地形地貌變遷之一環，河相之改變與

水流量決定之搬運能力及泥砂之供給量關係密切，水流量決定於集水區面積及氣候，泥砂之供給量則決定於包括河床沖蝕之地表侵蝕，以及中上游坡地之崩

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