

GIS 圖層及修正因子建置台灣通用土壤流失公式 (TUSLE) – 以石門水庫集水區為例

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摘 要 本研究選定較適合台灣地區使用之因子公式來建置台灣通用土壤流失公式 (TUSLE) 並估算台灣地區之土壤沖蝕量。經本研究修改後之降雨沖蝕性指數 R_m 計算式, 不但具有時變性, 更具有台灣降雨特性; 坡度 S 因子在本研究則採用 McCool *et al.* (1987) 之計算式, 用於台灣地區大部份皆屬陡坡地形之集水區時, 估算結果較 Wischmeier and Smith (1978) 所訂定之坡度因子更為理想; C 值在 NDVI 為負值時, 不採取線性之計算方式, 避免高估河川、建地等土壤沖蝕率低之地區; P 值則藉由台灣地區近期相關的田間試驗資料之蒐集、整理及歸納而獲得, 可作為決定水土保持處理因子時之參考。本研究亦建立 TUSLE 公式中, K_m 、 R_m 及 LS 等因子之 GIS 圖資, 可簡化台灣地區內各集水區土壤沖蝕量之估算流程及提昇正確性。

關鍵詞: 通用土壤流失公式、地理資訊系統、石門水庫。

Taiwan Universal Soil Loss Equation (TUSLE) Based on Revised Factors and GIS Layers- An Example from the Shihmen Reservoir Watershed

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ABSTRACT This study used factors and formulae suitable for Taiwan to establish Taiwan Universal Soil Loss Equation (TUSLE) and to estimate soil erosion. The revised equation of rainfall erosivity index, R_m , varies with time and possesses the rainfall characteristic of Taiwan. The formula of slope steepness factor, S , in this study was from McCool *et al.*(1987); the estimation results are better than that from Wischmeier and Smith(1978) when it is applied to the watersheds of steep topography in Taiwan. Not adopting linear equation to calculate the cover and management factor, C , when NDVI is negative could avoid overestimating the C values of areas of low soil erosion rate such as river, building land and so on. The support practice factor, P , determined using past research results conducted inland could be applied on conservation practices in Taiwan. The GIS layers of K_m , R_m and

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LS developed in this study can simplify the estimation procedures of soil erosion amount in every watershed in Taiwan, and raise the estimation accuracy.

Key Words: USLE, GIS, Shihmen reservoir.