林邊溪流域地表逕流模擬之初步探討

Preliminary Study on Surface Runoff Simulation in the Linbian River Watershed

國立屏東科技大學水土保持系

助理教授　　碩士生

張文彥*　　王智方

Wen-Yan Zhang　　Chih-Fang Wang

摘　要

林邊溪流域位於屏東縣中部地區，流域面積約 336.3 平方公里，地處熱帶與亞熱帶交界，氣候特性受梅雨與颱風季節顯著影響，常導致短時間內大量降雨，進而造成溪流水位急遽上升，進而誘發洪患風險。本研究針對林邊溪流域進行地表逕流模擬，整合土地利用、土壤及水文等資料，藉以模擬流域在不同降雨條件下之逕流反應。研究方法採用美國自然資源保育局（Natural resources conservation service, NRCS）提出之逕流曲線值方法（Curve Number, CN）進行逕流量模擬，並以實測降雨資料為輸入，建立流域水文模式，模擬不同降雨情境下之地表逕流量。降雨資料採用林邊溪流域周邊四座雨量站（新來義、南和、大漢山、泰武），藉由徐昇多邊形法計算各站權重，以求得代表性之平均降雨量。此外，本研究善用流域內的新埤流量站資料，比對模擬結果，藉以探討颱風事件期間累積降雨與地表逕流之變化，並驗證模型準確度。本研究成果可為未來林邊溪洪水模擬、防災預警及水資源管理提供基礎研究參考，期望將有助於提升區域水文災害調適能力。

關鍵詞：逕流曲線值，地表逕流量，水文模式

*國立屏東科技大學水土保持系助理教授

912 屏東縣內埔鄉學府路 1 號

Abstract

The Linbian River watershed, located in central Pingtung County, Taiwan, covers an area of approximately 336.3 km². Positioned at the boundary between tropical and subtropical climatic zones, the region is frequently affected by monsoons and typhoons, resulting in intense short-duration rainfall events that cause rapid rises in streamflow and increase flood risk. This study aims to simulate surface runoff in the Linbian watershed by integrating land use, soil types, and hydrological data to assess runoff responses under various rainfall scenarios. The Curve Number (CN) method, developed by the Natural Resources Conservation Service (NRCS) of the United States, was employed to estimate runoff volumes. Observed rainfall data served as input for constructing a hydrological model capable of simulating surface runoff under different precipitation conditions. Rainfall data were collected from four nearby rainfall stations— XINLAIYI, NAN HAN, DA HAN SHAN, and TAI WU—and the Thiessen polygon method was used to determine weighted average precipitation across the watershed. In addition, discharge data from the HSIN-PEI gauging station, the only flow monitoring station within the watershed, were utilized to evaluate the accuracy of the simulated runoff results. The analysis focused particularly on typhoon events, examining the relationship between accumulated rainfall and surface runoff during extreme weather conditions. The findings of this preliminary study provide valuable insights into the runoff characteristics of the Linbian watershed. The outcomes are expected to support future flood simulation, early warning systems, and regional water resource management strategies, thereby enhancing the watershed's capacity for hydrological disaster adaptation.

Keywords: Curve Number，Surface Runoff，Hydrological Model