

極端氣候變遷下高屏溪流域水文與地文環境之變異性調查分析

Analysis on the Variation of Hydrologic and Geomorphologic Environment for Kaoping Watershed Management Under Extremely Climate Change in Taiwan

蔡光榮¹ ■ 陳穎慧² ■ 江介倫³ ■ 陳怡睿⁴ ■ 陳昆廷⁵

K.J. Tsai,

Y.H. Chen,

J.L. Chiang,

Y.R. Chen,

K.T. Chen

2009年8月Morakot颱風挾帶超大強降雨襲擊台灣南部地區，嘉義縣、高雄市山區累積最大降雨量高達2,900公厘以上，而南投、臺南及屏東三縣亦超過1,500公厘，因此造成南台灣坡地嚴重山崩、土石流、洪患與土砂災害。依據水土保持局之衛星影像判釋分析顯示，高屏溪流域計有10,904處崩塌，總面積達18,113公頃⁽³⁾。鑑於此，本研究應用GPS/GIS/RS科技就受災集水區在極端降雨變異條件下，其自然環境受創產生劇烈變化後之災害發生特性進行分析探討，並考量極端氣候變異之外在條件改變下之水土災害發生機制，以及水文與地文環境變異之調查分析，進而提出災害防治策略，同時也配合水文及地文變異條件，重新調整坡地經營管理，以提昇集水區環境之耐災力與抗災性，本研究選取莫拉克風災受創嚴重之南台灣高屏溪流域作為空間研究區域，並選取近10年之重要颱風暴雨衍生之極端降雨事件為對象，探討極端氣候變異下高屏溪流域內、水文及地文變異衍生區域環境災害之最大可能影響範圍，最後提供相關單位作為研擬集水區永續經營治理策略及其防救災體系改善方案之參考。

Extreme rainfall intensities were brought by Morakot typhoon in August, 2009. The accumulated rainfall amount in Chia-yi & Kaohsiung area was more than 2,900mm within continuous 3 days during typhoon period. Landslide, debris flow, flooding and sediment related disaster were seriously induced by this event in Kaoping area. This research, mainly focuses on applying field investigations integrated with GPS/GIS/RS techniques to analyze the mechanism of sediment related disaster. According to the satellite image analysis project conducted by Soil and Water Conservation Bureau after Morakot indicated that more than 10,904 sites of landslide with total sliding area of 18,113ha were found by this project. At the same time, the compound disasters are also characterized based on their disaster type, scale, topography, geologic structures during the period of this research. Characteristics of debris flows, and landslides are collected from Kaoping watershed Study on the variation of hydrological environment under extreme climate change become an important issue concerned by Taiwan. This project was conducted by the researcher from different academic aspect on sediment related disaster induced by the Morakot event in Taiwan. Also, Kaoping watershed was selected as a major study area due to its seriously damaged by Morakot typhoon. The change of hydrological & geomorphologic environment under climate change during the past 10 years would be recognized by this research.

關鍵字：極端氣候、土砂災害、集水區經營

Key words: climate change, sediment related disasters, watershed management

*一〇二年十月二十五日在本會一〇二年宣讀之論文

長榮大學土地管理與開發學系¹講座教授²助理⁴教授

¹Distinguished Chair Professor, ²Assistant, ⁴Professor, Department of Land Management and Development, Chang Jung Christian University

國立屏東科技大學水土保持系³副教授

³Associate Professor, Department of Soil and Water Conservation, National Pingtung University of Science and Technology

國立成功大學水利及海洋工程學系⁵博士候選人

⁵Ph. D. Candidate, Department of Hydraulic and Ocean Engineering, National Cheng Kung University