

空間資訊技術於土石流減災決策支援系統建置之研究

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摘要 台灣位處歐亞大陸板塊與菲律賓板塊交接帶，地殼活動劇烈且岩石破裂，每逢颱風就容易發生嚴重之土石流災情，造成人民身家財產嚴重威脅。本研究目的為建立一套土石流減災決策支援系統 (Debris-flow Mitigation-disaster Decision Support System, DMDSS)，以作為災區植生工程與工程復舊之規劃依據。研究中使用飛機拍攝所得之空中攝影照片 (Aerial Photo) 與全球衛星定位系統 (Global Position System, GPS) 所測量之數值地形模型 (Digital Terrain Model, DTM) 等資料，再配合地理資訊系統 (Geographic Information Systems, GIS) 處理所得之圖檔資料及數值地形模型等相關資料，建立土石流量化分析及立體模擬飛行系統，提供山坡地土石流災區形成之環境資訊查詢及三維空間模擬，以供決策單位快速掌控災區現況及迅速擬定處理對策。

關鍵詞：土石流、決策支援系統、航照、全球定位系統、地理資訊系統、數值地形模型。

Using Spatial Information Technology for Debris-flow Mitigation-disaster Decision Support System

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ABSTRACT Taiwan Island is located on the suture zone of the Philippine Sea Plate and Eurasian Plate, featured with fractured rock bodies. When typhoon occurs, serious debris-flow take place that endangers common people and causes them to suffer numerous losses. The purpose of this research is to establish a debris-flow mitigation-disaster decision support system (DMDSS) for the vegetation and rehabilitation engineering. In this study, we used integrated aerial photography and digital terrain model (DTM) measured by Global Position System (GPS). Then we combined the aerial photo and DTM data with GIS to build the debris-flow soil volume analysis system and 3D fly simulation system by GIS. Our research can offer the environmental information about debris-flow disaster and 3D simulation to help the authorities to recognize the condition of disaster and come up with solutions immediately.

Key Words: debris flow, decision support system, aerial photo, GPS, GIS, DTM.

一、前言

西元 2001 年 7 月 30 日零時左右，中度颱風「桃芝」於台灣東部花蓮秀姑巒溪附近登陸，颱風中心橫

過中央山脈，並於當日的上午 10 點左右由新竹附近離開台灣本島進入台灣海峽北部。此次風災造成台灣地區遭受極為巨大之災害，多處鐵公路中斷，農業損失慘重，經濟損失高達 14 億元，而人員傷亡更造成驚人

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