

摘要

本計畫範圍位於烏溪水系上游大里溪支流—頭汴坑溪及草湖溪集水區，區內受 101 年 0802 蘇拉颱風豪雨影響，誘發頭汴坑溪及草湖溪集水區內山坡地多處崩塌及溪流沖刷，造成土石災害發生。為求徹底解決土砂災害、防範土砂災害之再度擴大，並維護當地居民生命財產及交通之安全。

本計畫以 101 年蘇拉颱風於本區所造成之災害區位為主，積極訪談太平區、霧峰區公所、村里長和土石流防災專員並進行現勘，以瞭解本區 102 年度新增災害規模和治理需求性，同時藉由歷年規劃和治理工程檢視，研擬未來本區保育治理基本方針，期能減輕或防止二次災害之發生，進而保護本區保全對象之安全。

為順利進行頭汴坑溪集水區與草湖溪集水區內災害點位之保護治理工作，本計畫檢視本區歷年規劃，調查歷年災害狀況，並蒐集歷年治理工程資料，以建置本區 14,480 公頃之地文、水文與人文基本資料。

為掌握區內之災害區位及災害特性，並整體掌握集水區之現況問題，本計畫於頭汴坑溪集水區與草湖溪集水區內，針對 101 年 0610 水災及 0802 蘇拉颱風後與 102 年本區新增災害點位進行現況調查。經由現況調查，本區內共有 16 處崩塌地災害、51 處野溪坑溝災害、10 處道路水土保持問題，另有 30 件既有工程構造物有損毀狀況、以及 14 條土石流潛勢溪流區位。

本計畫並根據本區現況問題，蒐集分析 44 年雨量、11 個集水分區水文量、分析 12 個集水分區土壤沖蝕量與崩塌地土砂生產量、檢算 6 處易致災溪段與 8 座橋梁之通洪斷面、分析兩重點溪段之表面粒徑與河床質粒徑、針對重點溪段進行測量共 32.2 公頃與無人載具空拍，並針對重點溪段進行一維與二維之水理模擬分析，以掌握頭汴坑溪與草湖溪之集水區災害特性。

根據本計畫針對頭汴坑溪集水區與草湖溪集水區內主要之災害類型與原因之分析，本計畫評估本區災害點位治理需求性屬優先處理與需要

處理者共 51 處，以掌握集水區之保育治理需求。同時藉由檢視歷年規劃報告、歷年災情與歷年工程，並分析集水區地文、水文水理與土砂特性後，研擬本區保育治理基本方針，針對各類型之災害狀況提出保育治理對策，分別提出各災害點位之保育治理措施，進行本區既有構造物之安全檢討，作為本區未來治山防災工作執行之參考。

根據本計畫評估頭汴坑溪集水區之保育治理需求性，與研擬之保育治理基本方針與保育治理對策，本計畫將頭汴坑溪集水區內保育治理需求性屬優先與需要處理之災害點位，依其位置及類型編定共 10 件工程，總工程經費為 75,000 仟元；草湖溪集水區內保育治理需求性屬優先與需要處理之災害點位，依其位置及類型編定共 7 件工程，總工程經費為 54,000 仟元。兩集水區治理計畫之總益本比約為 1.12，考量區域安全之重要性，具投資價值。

重點溪段部分，本計畫評估本區 12 處保育治理需求性評估為優先處理者，擇定本計畫優先治理區為頭汴坑溪集水區內北坑溪北田大橋下游溪段，草湖溪集水區則將草湖溪糖廊橋下游溪段列為重點治理區，此溪二重點溪段保育治理對策之探討可作為未來保育治理對策之重要參考，對於後續整治有重點參考意義。

北坑溪北田大橋下游溪段部分根據歷年之災害情形，本區於 101 年蘇拉颱風與 102 年蘇力颱風期間，有邊坡崩塌範圍與洪水沖毀護岸之情形。根據 HEC-RAS 模擬結果，在 50 年含砂水流之水文條件下，北坑溪北田大橋下游溪段流速較快，使堆積於坡趾之崩積土砂受水流沖蝕，並造成邊坡坡趾淘空狀況。本計畫針對此溪段規劃「北坑溪北田大橋下游溪段整治工程」，工程內容為：護岸 122.6m、固床工 4 座。

糖廊橋部分，根據本計畫現況調查結果，草湖溪糖廊橋常發生樹枝枯木阻塞橋底或橋面，減小通水斷面之狀況，並造成洪水漫淹橋面狀況；另於竹村枝 16 號崩塌地溪段有經常性災害與邊坡崩塌之情形發生。根據本計畫 HEC-RAS 模擬結果，在 50 年含砂水流之水文條件下，糖廊橋處通水

斷面不足，竹村枝 16 號崩塌地溪段坡趾易受溪流淘刷，易誘發上邊坡崩塌，並增加堰塞湖風險。本計畫針對糖廊橋所擬定之主要治理對策為進行糖廊橋改建，以改善通水斷面，使水流安全通過；本計畫針對竹村枝 16 號崩塌地溪段規劃「草湖溪糖廊橋溪段治理工程」，工程內容為：全套管基樁 H=15m，156 支、崩塌地整體調查規劃乙式，另針對草湖溪糖廊橋規劃「草湖溪糖廊橋改善工程」，工程內容為：橋梁改善乙式。

Abstract

The scope of this project encompasses the upstreams of Wu River—Tobian Ca River and watershed of Tsou Hu River. In this region, it was impacted by the heavy rainfall of 0802 Typhoon Saola of 2012 which triggered multiple landslides in the hills of Tobian Ca River and watershed of Tsou Hu River as well as suffering stream erosions, resulted with debris disaster. Therefore this plan intends to completely resolve as well as prevent from the reoccurrences of the sediment disasters in addition to protect the lives, property safeties of local residents and ensure safe transportation passages. This plan adopts the damages incurred from 2012 Typhoon Saola as the foundation and aggressively interviews the persons-in-charge at villages and neighborhoods of Taiping region, Wu Fong district office in addition to special agents of debris disaster prevention in addition to onsite surveys so as to understand the disaster status resulted from 2013 fiscal year as well as necessary governance requirements. Furthermore this plan also studies the countermeasures of conservation and management for this region with the expectation to alleviate and prevent from the occurrence of the damages suffered in the past and finally ensure the safeties of inhabitants of this region.

This plan reviews the annual planned reports, investigates annual disaster status in addition to collecting annual governance engineering information so as to establish and construct the basic physiographic, hydrological and humanities information covering area of 14,480 hectares.

In order to have a good grasp of the disaster location and disaster characteristics, this plan proceeds to onsite survey for both disasters occurred during 2012 and 2013. In this region there are a total of 16 landslide disasters, 51 locations suffered wild creek and ditch disasters, 10 locations with road water and soil conservation problems, 30 pieces engineering constructs with damages as well as 14 creeks with potential landslide damage.

Based upon the analyses targeted to major disaster types and causes of disaster in this plan, we find that the governance requirement for the disaster

location in this region is characterized as high priority and there are a total of 51 locations needed to be processed. Hence this plan proposes conservation and governance countermeasure according to various types of disasters to serve as references during the work and execution for future disaster prevention in the hillside region.

Hence this plan adopts the watershed in Tobian Ca River as the prioritized region as well as the location required processing. There are a total of 10 governance engineering projects with total engineering costs worth 75 million NTD. In addition, this project also treats the watershed of Tsou Hu River as the prioritized one as well and it is also the disaster location requiring processing. There are 7 engineering projects planned with a total engineering cost of 54 million NTD with benefit-cost ratio (BCR) around 1.12 which is deemed as worthwhile for investment.