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論文名稱：打樁編柵應用於崩塌地植生復育及適用性之研究

英文論文名稱：Study of Vegetation Recovery and Suitability for Staking
and Wattling Method Applying on Landslide Area

【中文摘要】

1982 以來 4 次的崩塌地調查比較，2000 年後不論崩塌處數或面積皆比以往增加很多，主要係受 921 集集大地震及桃芝風災影響甚大，發生崩塌之坡度在 30° ~ 45° 最多，其次為 15° ~ 30° ，崩塌數量以山坡地及林班地居多，在台灣中部發生崩塌之地質以卓蘭層、頭嵙山層及桂竹林層最多，因崩塌須治理區非常多，政府在詳細分析施工時效及維護管理等項目下，以打樁編柵搭配縱橫向排水構築、石籠防砂壩、植生覆蓋、稻草蓆敷蓋、編柵間植生造林等配套規劃，雖未百分之百成功，但在時效上已獲得相當的成果，且至 93 年 7 月底止使用此方法於崩塌地緊急處理 4,638 件、打樁編柵總長度超過 549 萬公尺，並增加 1,426,722 人次之在地就業商機。

打樁編柵在崩塌地治理與植生復育方面，較顯著的功效經觀察分析得知為

1~4 項：

1. 增進生育基盤，使種子易發芽生長覆蓋，減少土壤裸露，避免發生二次土石災害。
2. 搭配水土保持先趨草類的導入，穩固土壤保持水分，有效帶動周邊鄉土

植物的入侵，縮短植被復育的時間。

3. 在編柵間植樹造林，打樁編柵攔阻土石堆積在編柵體腐爛功成身退後，起而代之，成為保護大地的綠資源。

4. 減緩整個坡面，降低流速、增進水的滲透，減少對下游坡面的衝擊破壞。

5. 本研究經現場調查、入滲試驗及土壤物理實驗分析獲得結果如下：

(1) 針對 63 個打樁編柵工法調查區，發現實施打樁編柵後植生覆蓋率 $\geq 50\%$ 佔有 71%，水土保持效果良好。

(2) 打樁編柵的平均間距介於 2~4 m 之間者佔調查區的 76.1%，有五成以上調查區植生覆蓋率 $> 50\%$ 。

(3) 實施打樁編柵區的平均坡度以 55~100%(29°~45°) 佔調查區的 80% 最多，有七成以上植生覆蓋率 $> 50\%$ ，坡度超過 100% (45°) 佔 14%，但地表植生覆蓋率有六成以上 $< 50\%$ ，因此，打樁編柵不宜於坡度過陡的裸坡上施設。

(4) Guelph 滲透計於崩塌地及未崩塌地之入滲實驗，比較入滲特性得知，崩塌地土壤最初入滲率大於未崩塌地，顯示崩塌地土壤較鬆散、土層淺，構造較不穩定，且土壤安定性降低。

(5) 土壤分析以崩塌地有機質流失現象最顯著，總孔隙度以未崩塌地較高於崩塌地，質地以黏土的植生復育能力最不好。

【英文摘要】

The compared with 4 times landslide investigation from 1982 year, There are increase so many landslide points and area after 2000 year, The master influence lay in the fact that 921 earthquake and Taurchih typhoon. Landslide had happened all most on the slope of 30 to 45 degree, then on the slope of 15 to 30 degree.

Analysis the results of stake and wattling method and vegetation recovery on landslide:

1. There could be improve breeding base place, Let seed easy to germinate,growth,reduce bare soil and avoid happen second rock disaster.

2. Immigration pioneer conservation plants, It could be stability soil water , immigrated native plants and shorten the time of plant recovery.

3. If forestations between stake and wattling, It could be protected earth after wood stake decompose.

4. Reduce slope degree, velocity of flow, improve infiltrate of soil water, the impact of the swift current against the downstream.

5. Results of the investigates of landslides to construct stake and wattling are as follows:

(1) After practicing of staking and wattling , the rate of vegetation cover over than 50% takes 71% , the effects of soil and water conservation was fine.

(2) The investigation results indicated that, the average distance of staking between 2 to 3 meter was over than 70% , and between 3 to 4 meter takes 42% , the rate of vegetation cover was fine.

(3) The average slope of staking and wattling practice between 55~100% takes 80% , and over than 100% takes 14%. But the rate of vegetation cover over than 60% was not so good. Therefore staking and wattling method was not suitable for bare area of steep slope.

(4) The inside of landslide of primary infiltration is greater than outside of landslide. The result represent soil construction is unstable.

(5) The inside of landslide of soil organic matter and porosity are less then outside of landslide.