

應用數值模式於東眼山堰塞湖潰決影響範圍模擬

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摘要 112年8月卡努颱風造成臺灣中部山區多處土砂災害，在南投縣仁愛鄉山區誘發多處山崩及土石流災害。於卡努颱風期間仁愛鄉南豐村東眼山受洪水沖刷，致溪岸邊坡發生崩塌，並阻塞河道形成堰塞湖，其崩塌坡面長約230公尺、寬約150公尺、堆積材料逾43,000立方米、蓄水體積約5,000立方米。現場調查發現，崩塌右側坡腳和堰塞壩體表面已出現滲流現象，其壩體DBI計算值約4.3(屬不穩定狀態)，加之上游集水區面積約500公頃，後續該阻塞處受降雨自然沖毀可能性極大。為探究天然壩潰壞對於下游河岸聚落之影響，本研究藉由HEC-RAS二維水理模式模擬堰塞湖潰決影響範圍，其潰決洪峰對下游2.7公里內聚落無衝擊影響。結果顯示HEC-RAS壩體潰壞模組可協助評估潰決洪峰對河岸聚落之致災性，可有效模擬潰決洪峰影響範圍，作為相關單位防災應變決策參據。

關鍵詞：堰塞湖、潰決洪峰、HEC-RAS

Apply HEC-RAS to simulate Mt. Tung-Yen landslide-dammed lake breach and impact area

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Abstract Typhoon Khanun caused numerous sediment-related disasters in the central mountain area of Taiwan, especially landslides and debris flows in Renai Township, Nantou County. The slope of Mt. Tung-Yen was affected by heavy rainfall and riverbank erosion, which triggered a landslide and formed a landslide-dammed lake. The landslide exhibits geometry features of 230 m in length, 150 m in width, a deposition volume of 43,000 m³, and a storage volume of 5000 m³. According to in-situ investigations, both the foot and surface of the natural landslide dam have the infiltration phenomenon and the Dimensionless Blockage Index (DBI) is measured at 4.3, which indicates that the natural landslide dam is highly unstable and easily flushed away by rainfall-runoff. To assess the impact of the barrier lake breach surge on the riven village, this study applies HEC-RAS to simulate the dam breach flooding area. The simulation results reveal that the downstream village located 2.7 km downstream remains unaffected by the dam breach surge. The dam-breach mode of HEC-RAS can evaluate the disastrous impact of dam breach surges, including inundation area, peak discharge water level, and flooding wave velocity. This information helps the authorities in planning disaster prevention and mitigation strategies.

Keywords: Landslide-dammed lake, Dam breach surge, HEC-RAS

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