

## 土石流設計流量之可靠性分析

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**摘 要** 土石流流量的估算是評估土石流災害潛勢及土石流防治工程設計的重要依據。本文以機率的觀點，考量土石流體積濃度、逕流係數、集水區面積、坡面長度、坡面之漫地流流速、溪流長度及溪流縱斷面高度等七個水力參數的不確定性，利用泰勒級數展開法，建立土石流流量計算之機率關係式，此關係式包含一個定率項及一個機率項。以花蓮縣復興社區土石流溪流資料，分析關係式中各項參數之敏感度，並計算在各種不同變異係數、機率及重限期距條件下之土石流設計流量。

**關鍵詞：**土石流流量、不確定性、敏感度、變異係數、機率。

## RELIABILITY ANALYSIS ON DEBRIS-FLOW DESIGN DISCHARGE

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**ABSTRACT** Debris-flow discharge is an important information prior to assess debris-flow hazard potential and to design various countermeasures. This paper develops a relationship for calculation of debris-flow discharge in a view of probability. The relationship contains the rainfall return period, hydrogeological and topographical parameters, such as runoff coefficient, watershed area, sediment concentration, length and velocity of overland flow, and the horizontal length and elevation difference of a considered stream reach. With consideration of parameters uncertainty and basing on the Taylor series expansion method, a probability equation for debris-flow design discharge is developed. The probability equation contains a deterministic term and a probabilistic term. The sensitivity of each parameter in this equation is analyzed. Calculations of debris-flow design discharges for Fushing village, Haulien at various conditions of the coefficient of variation, probability, and rainfall return period are also conducted in this paper.

**Key Words:** debris-flow discharge, uncertainty, sensitivity, coefficient of variation, probability.