

Title : Flash Flood Susceptibility Model of Mae Wang River Watershed, Mae Wang District, Chiang Mai Province

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ABSTRACT

The Mae Wang watershed is considered a high-risk area for flash floods. In 2022 and 2024, flash floods occurred in Mae Win and Ban Kad sub-districts, Mae Wang district, Chiang Mai province, causing severe damage to residential areas and agricultural land. Multiple factors, including heavy rainfall, soil type and vegetation cover, and geomorphological characteristics, influence flash flood occurrences. This study's purposes are to identify the geomorphological factors contributing to flash floods and develop a flash flood susceptibility model for Mae Wang watershed. The methodology involves calculating geomorphological parameters, ranking flood susceptibility levels, and creating a flash flood susceptibility model for the watershed. The result separates the Mae Wang watershed into nine sub-watersheds. Wang Sai and Wang Tai are highly-very high susceptible to flash floods, that is account for 19.1% of the total watershed. Huai Win, Mae Tian, Wang Khwa and Wang Klang are moderately susceptible to flash floods, accounting for 52.9% of the total watershed. The low susceptibility to flash floods accounts for 28% of the total watershed, consisting of Mae Mud, Mae Sapok, and Mae Puai sub-watersheds. Field observations suggest that high elevation, circular-shaped watersheds and high average slope characterize the highly susceptible areas to flash floods. The moderately susceptible areas to flash floods are circular-shaped,

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narrow valleys and high average slope. The watersheds with the lower flash flood susceptibility are elongated and comparatively low average slope. Based on the findings, the key geomorphological factors influencing flash flood susceptibility in Mae Wang watershed include circular-shaped sub-watersheds, significant topographic relief, high average slope gradients, soil type and vegetation. The study and the development of the flash flood susceptibility model can significantly contribute to early warning systems, preventing and reducing the potential losses of communities against future flash floods.

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