Flood Damage Assessment in Taipei City, Taiwan

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ABSTRACT

In this study, we reviewed the literature on flood damage assessment and collected information for related research in Taiwan to analyze the relationships between direct flood damage, flood frequency, flood depth, and land-use. The procedure for flood damage assessment was then developed that includes the following steps: (a) Scenario simulation of inundation potential. (b) Establishment of the relationship between inundation depth and damage loss for varied land-use. (c) Risk analysis of inundation damage.

Taipei City in north Taiwan was adopted as the case study to demonstrate the proposed algorithm. Flood events with return periods of 5, 10, 25, 50, 100 and 200 years were used for flood hazard analysis to cover possible flooding scenarios. The inundation hazard maps were first generated via hydraulic modelling. The regional flood damage was then estimated using a relationship between inundation depth and damage. The flood damage exceedance probability (EP) curve for Taipei City was constructed following the association of the loss with its probability of occurrence. The flood damage EP curve was further used to integrate the damage assessments for individual flood events for a full probability range presentation of the flood risk. The expected annual damage was calculated by integrating the area under the EP curve.

KEYWORDS

Inundation potential, average annual flood loss, exceedance probability curve