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Debris Flow Vulnerability Assessment in Urban Area Associated with Landslide Hazard Map : Application to Busan, Korea

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In this presentation, an urban debris flow disaster vulnerability assessment methodology is suggested with major focus on urban social and economic aspect. The proposed methodology is developed based on the landslide hazard maps that Korean Forest Service has utilized to identify landslide source areas. Frist, debris flows are propagated to urban areas from such source areas by Flow-R model, and then urban vulnerability is evaluated by two categories; physical and socio-economic aspect. The physical vulnerability is associated to buildings that can be broken down by a landslide event directly. This study considers two popular building structure types, reinforced concrete frame and non-reinforced concretes frame, to evaluate the physically-based vulnerability. The socio-economic vulnerability is measured as a function of the resistant levels of the exposed people, the intensity and magnitude of indirect or intangible losses, and preparedness level of the local government. An indicator-based model is established to evaluate the life and indirect loss under urban debris flow disasters as well as the resilience ability against disasters. To illuminate the validity of the suggested methodology, physical and socio-economic vulnerability levels are investigated for Daejeon, Korea using the proposed approach. The results reveal that the higher population density areas under a weaker fiscal condition that are located at the downstream of mountainous areas are more vulnerable than the areas in opposite conditions.

Key words: Debris flow disasters, Physical vulnerability, Socio-economic Vulnerability, Urban

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