

Developing Improvements to Multi-Hazard Risk Assessments

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Abstract : This paper outlines the approaches taken to assess multi-hazard assessments. There is currently confusion in assessing multi-hazard impacts, and so this study aims to determine which of the available options are the most useful. The paper uses an international literature search, and analysis of current multi-hazard assessments and a case study to illustrate the effectiveness of the chosen method. Findings from this study will help those wanting to assess multi-hazards to undertake a straightforward approach. The paper is significant as it helps to interpret the various approaches and concludes with the preferred method. Many people in the world live in hazardous environments and are susceptible to disasters. Unfortunately, when a disaster strikes it is often compounded by additional cascading hazards, thus people would confront more than one hazard simultaneously. Hazards include natural hazards (earthquakes, floods, etc.) or cascading human-made hazards (for example, Natural Hazard Triggering Technological disasters (Natech) such as fire, explosion, toxic release). Multi-hazards have a more destructive impact on urban areas than one hazard alone. In addition, climate change is creating links between different disasters such as causing landslide dams and debris flows leading to more destructive incidents. Much of the prevailing literature deals with only one hazard at a time. However, recently sophisticated multi-hazard assessments have started to appear. Given that multi-hazards occur, it is essential to take multi-hazard risk assessment under consideration. This paper aims to review the multi-hazard assessment methods through articles published to date and categorize the strengths and disadvantages of using these methods in risk assessment. Napier City is selected as a case study to demonstrate the necessity of using multi-hazard risk assessments. In order to assess multi-hazard risk assessments, first, the current multi-hazard risk assessment methods were described. Next, the drawbacks of these multi-hazard risk assessments were outlined. Finally, the improvements to current multi-hazard risk assessments to date were summarised. Generally, the main problem of multi-hazard risk assessment is to make a valid assumption of risk from the interactions of different hazards. Currently, risk assessment studies have started to assess multi-hazard situations, but drawbacks such as uncertainty and lack of data show the necessity for more precise risk assessment. It should be noted that ignoring or partial considering multi-hazards in risk assessment will lead to an overestimate or overlook in resilient and recovery action managements.

Keywords : cascading hazards, disaster assessment, multi-hazards, risk assessment

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