

Developing Chiang Mai building inventory for earthquake loss assessments

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ABSTRACT

Earthquakes, though categorized as low-frequency disasters, can unleash substantial devastation, resulting in injuries, fatalities, and structural collapses. This research endeavors to construct a city model for Chiang Mai, with the goal of assessing earthquake-induced impacts and damages. Termed the "Catastrophe Model", this initiative encompasses three primary components. The first phase entails building a comprehensive database and conducting field surveys to gather precise building footprints and detailed structural information. Currently, our project has successfully surveyed 4,118 sample buildings out of a total of 109,728 within the study area. Analysis of the survey data reveals that the most prevalent structural type in Chiang Mai is C3 (Concrete Frame with Unreinforced Masonry Infill Walls), comprising 3,101 buildings, constituting 75.30% of the total. These are further segmented by occupancy class: RES1 (Single Family Dwelling) with 1,638 buildings, RES3 (Multi Family Dwelling) with 366 buildings, COM1 (Retail Trade) with 313 buildings, and various others. Furthermore, to develop fragility curves, 123 and 138 building designs were collected from Mae Hia and Chiang Mai Municipality, respectively. Consequently, exposure maps for Chiang Mai can be formulated. The Catastrophe Model's development will facilitate the preparation of effective incident response plans and risk mitigation measures. It will also enable the creation of web applications for disseminating research results efficiently to users. Furthermore, publication and demonstrations will benefit various stakeholders, including the insurance industry, hospital emergency response planning, and public awareness campaigns in Chiang Mai.

Keywords: Earthquake Loss Assessments, Building Inventory, Catastrophe Model, Exposure Maps, Field Surveys