

Disaster Risk Management and Seismic Risk Assessment of Cultural Heritage Adobe Buildings: A Methodological Review



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ABSTRACT

Adobe buildings constitute a significant portion of the global building stock and represent invaluable cultural heritage assets; however, their low lateral load resistance and lack of structural integrity make them highly vulnerable to seismic hazards. The objective of this study is to systematically evaluate how scientific literature addresses disaster risk management and seismic safety for adobe buildings. This study aims to synthesize various methodological approaches used to assess seismic risks by using a comprehensive literature review of current, English written research articles collected from Web of Science and Scopus databases. The study results reveal that approaches vary from territory to structural scale, and each scale is shaped using different approaches and methodologies (e.g., 9 parameters indices at territory scale; macro-seismic and mechanical methods at structural scale). Additionally, the results demonstrate that integrating emerging technologies such as AI-based deep learning tools and real-time damage prediction systems can automate the classification of building exposure models (e.g., roof and diaphragm flexibility). Furthermore, the study reveals that adobe buildings are susceptible to lateral seismic loads and carry a high risk of collapse, highlighting the vital importance of effectively implementing preventive strengthening and retrofitting strategies. This study will pave the way of researchers focusing on disaster risk management, particularly earthquake risk assessment, in adobe buildings with cultural heritage value.

KEY WORDS: Adobe building, Disaster risk management, Seismic risk assessment