GIS MULTISOURCE DATA FOR THE SEISMIC RISK ASSESSMENT OF URBAN AREAS

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ABSTRACT

In 2020, natural disasters affected around 100 million people worldwide, highlighting the need for improved risk assessment and preparedness, especially in densely populated urban areas prone to seismic events, like Lisbon City.

Although comprehensive seismic risk models for Lisbon exist, the lack of a user-friendly, real-time tool for assessing earthquake impacts and implementing effective evacuation plans is evident. The broad aim of the study is to develop a 3D web-GIS platform to address this gap by providing dynamic, real-time visualizations of urban vulnerabilities to earthquakes, incorporating 3D building models to improve risk communication and support effective response strategies.

This platform will enhance decision-making for policymakers, urban planners, and national civil protection agencies by offering detailed visualizations of potential earthquake impacts and facilitating the coordination of emergency response efforts. By streamlining access to critical information for rapid and efficient disaster response, the platform will not only aid in saving lives and reducing economic losses but also support national civil protection efforts in making urban environments safer and more resilient against seismic hazards.

The study started with a comprehensive literature review, evaluating existing seismic risk models to identify weaknesses and strengths that support the development of a more robust model for urban seismic vulnerability assessment. Currently, in its second phase, the focus has shifted to collecting diverse data types, including remote sensing imagery, geology data, topography data, building characteristics and the application of machine learning techniques to develop predictive models for seismic events and automatically simulate post-event scenarios.

Keywords: Earthquake preparedness, urban resilience, post-event response.