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Editorial: Seismic resilience, vulnerability and energy efficiency in respect of climate change

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Editorial on the Research Topic

Seismic resilience, vulnerability and energy efficiency in respect of climate change

The unfolding narrative of climate change is leaving indelible impacts worldwide, challenging the very fabric of urban infrastructure. As the environment undergoes swift and profound transformations—marked by soaring temperatures, recurrent flooding, and landslides—side by side with cataclysmic earthquakes, the vulnerabilities of our constructed landscapes emerge starkly. No longer can we remain mere spectators; the exigency now is to engage with solutions that encompass durability, sustainability, and resilience.

In this backdrop, this Research Topic (RT) titled *Seismic resilience, vulnerability and energy efficiency in respect of climate change* centers on the vital intersection of seismic safety and energy efficiency. Traditionally viewed through distinct lenses, the zeitgeist now mandates a harmonized approach, embedding both these elements cohesively in architectural and structural strategies. The assemblage of contributions in this RT showcases a spectrum of critical reviews, insightful overviews, innovative methodologies, and empirical analyses, all charting a course through the intricate terrains of seismic resilience in a climate-altered world.

One of the standout papers named: “Seismic and energy integrated retrofit of buildings: A critical review” (Ademovic et al.) offers a nuanced review of the seismic and energy-integrated retrofit of buildings, with a particular focus on the European context. The piece underscores the prevailing gap—a tangible absence of a comprehensive strategy that effectively melds these two critical aspects. Though strides have been made, the paper’s insights signal the urgent need for forward-looking research and groundbreaking solutions.

The preservation of heritage—a treasured legacy that cities worldwide cherish—emerges as a recurrent theme. Another compelling contribution entitled: “An overview on seismic analysis of masonry building aggregates” (Formisano and Ademovic) illuminates the seismic analysis of masonry building aggregates, emblematic of Mediterranean countries. This RT weaves a rich tapestry of diverse analytical scales,

culminating in a cogent argument for tailored vulnerability assessment instruments and robust mitigation stratagems.

Our understanding of climate dynamics is perpetually evolving. Adapting to this fluidity, another remarkable paper “On the use of climate models for estimating the non-stationary characteristic values of climatic actions in civil engineering practice” (Abrahamczyk and Uzair) navigates the intricacies of estimating the evolving characteristic values of climatic actions, rooted in cutting-edge climate model projections. This timely narrative underscores the primacy of continually recalibrating our design codes to resonate with the ever-shifting climate contours.

Lastly, a thought-provoking piece “Decision-making approaches for optimal seismic/energy integrated retrofitting of existing buildings” (Caruso et al.) delves deep into the decision-making matrix, championing the dual imperatives of seismic safety and energy efficiency in retrofitting endeavors. Through the prism of multi-criteria decision-making paradigms, the paper unfurls a holistic perspective on discerning the optimal pathways for retrofitting.

To encapsulate, this RT resounds with a clarion call, urging the civil engineering and architectural community to reimagine our structural legacy. Our collective mandate crystalizes: to conceptualize and retrofit edifices that not only withstand the earth’s tremors but also embody our unwavering commitment to sustainability and energy conservation. As we embark on this pivotal journey, may these scholarly contributions illuminate our path, guiding our endeavors, and sparking further explorations. Embracing this transformative trajectory, we aspire for a future that’s resilient, sustainable, and harmonious.

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