

Assessing the Impact of Seismic Risk Mitigation at the Urban Scale on Community Resilience and Housing Recovery

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ABSTRACT

European historical city centres are particularly prone to natural disasters. This is due to the fragility of structures that often times do not comply with seismic codes; the high constructions’ density that causes induced damage; and the historical relevance of buildings that makes difficult the enacting of mitigation strategies.

In Italy, major earthquake caused extensive damages over the last century. Seismic events have a huge impact on the Nation’s economy growth due to direct and indirect impacts, such as for example the high reconstruction costs or the business interruption spread out over a long period, respectively [1]. In addition, the duration of recovery can affect the population wellbeing and cause permanent displacement [2]. For this reason, the preventive planning of disaster management strategies are crucial to mitigate the damage and enhance resilience. Proposed strategies have to be effective and economically sustainable.

In this paper, a town affected by the 2012 Northern Italy Earthquake is chosen as a case study to analyze the reconstruction process. Using information published on the town journal, relevant aspects of the community resilience are highlighted. In particular, the housing recovery is investigated and compared with that of a nearby city affected by the same earthquake.

Then, a suite of seismic mitigation strategies is proposed taking into account the peculiarity of the built environment. These strategies are applied to a small sub-system of the city, as geometrical and structural features are available thanks to an extensive survey. A recently validated methodology for risk assessments at the urban scale [3] is used to evaluate the variation of the seismic vulnerability and expected damage. Finally, the effectiveness of the proposed strategies is assessed through a cost-benefit analysis.

REFERENCES

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