

Socio-spatial vulnerability assessments for recovery scenarios?

Insights from 2012 Emilia earthquake

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As highlighted in disaster research, an earthquake can “act” as an accelerator of processes at different levels: the factors might be already present in the social system but their “being there” can be amplified or even revealed by the “faults” apparently activated by the triggering agent. The evaluation of the interaction between social vulnerability and damage caused by an earthquake could be an enlightening tool for mitigation actions during the pre-event phase (e.g. territorial and emergency planning) and in order to manage the recovery phase. A zoning of the social vulnerability factors can be integrated with a geolocalization of the damage, in order to evaluate how some of these factors could lead to different recovery scenarios.

The aim of this study is to analyse socio-spatial accelerator processes at stake during a disaster management, evaluating recovery trajectories based on a *social zoning* of the earthquake. We used a GIS based approach to identify different spatial patterns of socio-economic indicators providing the basis for determining a frame of social vulnerability at the moment of the 2012 earthquake. Five social vulnerability indicators (SVI) that contribute to increase vulnerability were selected, mapped and spatially correlated to a building damage index (BDI) calculated using geo-referenced information of damaged buildings available for the whole Mirandola territory - a 25.000 inhabitants town hardly hit by the earthquake, Emilia Romagna region, Northern Italy.

Through a bivariate LISA statistic (Local Indicator of Spatial Association) we test for spatial clustering between SVI and BDI. Despite an alleged virtuous model - so presented by local and regional institutions- the results suggest that some social vulnerability factors considered in the literature are effectively drivers of vulnerability. Furthermore, the same factors are partially or not considered in the recovery management, becoming thus drivers of vulnerabilization processes actually at stake in the post-event phase. Hypothesis of recovery scenarios (and future challenges) could be assessed integrating our analysis into the political processes ongoing in the aftermath.