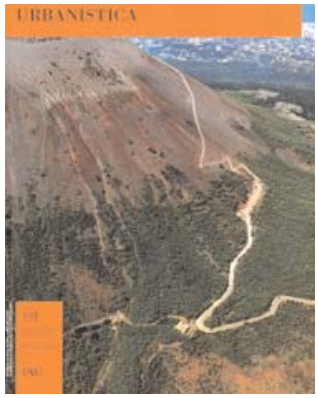

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Vulnerability analysis in the historic centre of Salò

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The Salò historic centre seismic vulnerability assessment was carried out in the context of an Italian national project to apply a general methodology developed by a multidisciplinary group of experts. Two fundamental concepts guided the latter: on the one hand the need to assess carefully the seismic response of traditional buildings representing an important testimony of the past while being potentially vulnerable to ground shaking; on the other, the idea that historic centres are not made only by monuments but also by places, open spaces, roads, ordinary buildings, and by the relationship between places and people.

The following types of vulnerability were investigated in the Salò historic centre: physical and systemic. The first was further split in two fields of concern: physical vulnerability of individual buildings and of blocks. The latter to be considered as a structural ensemble, made by buildings connected one to the other so as to respond to earthquakes differently from how each individual building would do taken separately.

The survey tool and the evaluation matrix developed by the National group for seismic response was applied to a sample of buildings.

The contribution of the conservation research unit proved fundamental in showing how samples could be better chosen through careful analysis of historic documents and being grounded on the recognition of buildings development over time. Furthermore, historic analysis provides insight on the processes behind present vulnerability patterns, showing which traditional practices and turning points in history have shaped buildings and blocks as they can be seen today.

A second step in the physical vulnerability assessment regarded structural blocks. Among the new set of parameters developed to survey and assess blocks' behaviour, the following can be mentioned: continuity of floors, presence of rooms and volumes clearly superimposed on the original structure, layout with respect to topography.

In order to assess the systemic vulnerability, open spaces, roads and life-lines were analyzed. Those are particularly important in appraising what would be the functional response in case of earthquake, how strategic facilities would cope and how quickly return to normal life can be conceived. Systemic vulnerability permits to link the inner analysis of the historic centre with its wider urban and territorial context, identifying crucial links for social life and economic activities.

The two types of vulnerability assessments opens a variety of risk prevention options, considering not only buildings seismic retrofitting but also improvements in the connection among open spaces, accessibility to the historic centre.

The damage scenario constitute another important support to mitigation strategy decisions. The damage scenario, obtained as the combination of hazard and physical and systemic vulnerabilities, was run in different periods of the year and hours of the day, to take into account the varying exposure conditions in a tourist place like Salò. Not only the rough number of exposed people can vary significantly but also their distribution in places and buildings with different vulnerability levels as well as the pressure they put on lifelines and other facilities.

As a conclusion to this summary, the relationship between risk prevention and sustainability may be recalled, that has been increasingly discussed by scientists as well as by international agencies. In this particular case, it must be pointed out that 'sustainability' does not refer only to the natural and landscape capital that must be preserved for future generations, but also to the historical capital, that can be threatened not only by time degradation but also by natural hazards, as recognised by the project launched by Unesco on 'historic patrimony at risk'.