Abstract

Urban survey methodology and procedure in seismic risk prior evaluation: knowledges combination of Cravegna urban settlement (VB)

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The thesis deals with the experimentation of a methodology of urban survey and knowledge about preservation in the building up of a cognitive framework for the evaluation of the seismic vulnerability of urban settlements in seismic areas. The work derives its main orientation instruments and methods from the relative regulations and orientation protocols, and more specifically from Norma UNI 7310/74 and from “Studio propedeutico all’elaborazione di strumenti d’indirizzo per l’applicazione della normativa sismica agli insediamenti storici”. My thesis has followed an experimental iter as an attempt to apply the seismic laws of Norme tecniche per le costruzioni to the aggregated heritage and to historical urban settlements in seismic areas.

The research has to be understood as the first step of the seismic risk evaluation of artifacts and old towns, which will have to be followed by quantitative analysis carried out by the disciplines of structures, and by the evaluation of the reliability of results obtained. Prevention of seismic damage is the reasoning of this research, which aims at being a guide and a management vehicle for drafting and/or modifying the district government’s instruments and for preventive improvement projects for the preservation of historical buildings.

The survey takes shape as multi-scale studying. The issues involved are seismic dangerousness, exposition and vulnerability: these factors combined together represent the level of seismic risk of the settlement.

The methodology for knowledge has been applied to the Cravegna urban settlement, in Crodo’s municipality (VB). This study case has been believed representative because of its location in one of the Piemontese districts catalogued as 3S seismic zone and thanks to its significant peculiarities and its aggregated shape of historic buildings.

The building up of the cognitive framework developed through critical urban survey, which has allowed the drafting of processed summaries.

The first part of the thesis deals with the historic development of the urban settlement, the limitation of historical centres and the evaluation of their transformations, simultaneously surveying nowadays status; the symbolic language of Norma UNI 7310/74 has been adjusted carefully for the right stereometric illustration of the study case and in order to represent every single element, which have to be considered in evaluation of seismic risk (Fig. 1). The survey has moved on to the analysis meant to locate the elements of the village with historical, cultural and environmental worth, and to evaluate the seismic dangerousness of the settlement and human lives’ exposition.

Next, the research focusses on the survey of one the specific historical settlements in Cravegna, with the aim of understanding the local architectural rules, by studying different levels and urban fronts of buildings. The research in archives has filled the gaps of the survey (Fig. 2). This stage has allowed to identify some aggregates and to evaluate qualitatively their own level of criticality. Later, the structural unities of aggregates have been identified and analyzed in their dynamics, material and structural components in order to find out their building and interaction vulnerabilities (Fig. 3). A thematic architectural survey of materials and decay has been carried out in order to stress the structural and documentary worth of every components of buildings which are essential to
the whole evaluation of seismic vulnerability; as a consequence, it involves the analysis of building hubs.

Figure 1 - Tav. 2. Insieme: rilievo urbano – stato di fatto
Figure 2 - Tav. 5a. Insediamento storico 1A: rilievo della consistenza architettonica
Figure 3 - Tav. 7b. Insedimento storico 1A: individuazione delle vulnerabilità negli aggregati A6, A11, A12, A13, A14 e A25
The conclusions emerged from the thesis can be considered as a starting framework which can lead to following in-depth analysis to reach an adequate level of human lives safety and of cultural, historical, economical and social values linked to them; these qualities are innate in every single material and immaterial element which, considered in a systemic point of view, build up the historical urban heritage, a complex “cultural system”.

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