



## **A social vulnerability index to flood hazards of municipality of Florence (Italy)**

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Although floods are completely natural phenomena, the human activities have made them more frequent, and even atmospheric events of not exceptional magnitude can cause flooding of great importance. For this reason, the study of flooding phenomena and the estimation of related risk is important for the increasing of number of events and of their intensity as well as for the growing hazard for people, houses and infrastructures. For the territory analyzed in this study, the municipality of Florence, the risk for the cultural heritage has to be also added.

The aim of the work presented here is the study of social vulnerability of Florence to flood hazards. Although different groups of society are exposed to a natural risk in a similar way, the risk has different consequences since diverse are the skills and the abilities to react to a danger. Some population groups have less ability to anticipate, cope with, resist, and recover from the impact of flooding due to economic, social, physical health, communication and information inequalities. For example, the “ability to cop” factor is often related to gender and age point of view because the women, on average, receive lower wages and they have greater family care responsibilities as the care of children and the elderly, when both may be characterized by a limited mobility.

After a careful review of the literature, a list has been drawn up containing 17 variables which represent the many features of the municipal context. These variables are divided into five categories, the macro-factors of risk, which are: ability to cope, ethnicity, access to resources, household arrangement and built environment. Some data have been obtained from ISTAT (Italian National Institute of Statistics) and are related to the census of the population at the year 2011, others are acquired by the statistical yearbooks of the municipality of Florence and the dwelling values from the observatory of the real estate market of the Italian Revenue Agency. A social vulnerability index (SoVI), that measures social vulnerability to hazards through a quantitative analysis created by data representing socio-economic variables of people living in a well-defined geographical area is calculated. Although a single number simplifies such a complex phenomenon, only through this simplification it is possible to create maps using geographical information systems. Overlapping these maps with the risk maps, the areas that are both socially weak and characterized by a high risk are defined. Providing the outcomes of the investigation to the competent authorities, risk management can be improved and the economic resources for protection and prevention interventions best exploited.