



Flood vulnerability evaluation in complex urban areas

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This paper deals the conception, the development and the subsequent validation of an integrated numerical model for the assessment of systemic vulnerability in complex and urbanized areas, subject to flood risk.

The proposed methodology is based on the application of the concept of “systemic vulnerability”, the model is a mathematician-decisional model action to estimate the vulnerability of complex a territorial system during a flood event. The model uses a group of “pressure pointers” in order to define, qualitatively and quantitatively, the influence exercised on the territorial system from factors like as those physicists, social, economic, etc..

The model evaluates the exposure to the flood risk of the elements that belong to a system.

The proposed model, which is based on the studies of Tamura et al., 2000; Minciardi et al., 2004; Pascale et al., 2008; considers the vulnerability not as a characteristic of a particular element at risk, but as a peculiarity of a complex territorial system, in which the different elements are reciprocally linked in a functional way.

The proposed model points out the elements with the major functional lost and that make the whole system critical.

This characteristic makes the proposed model able to support a correct territorial planning and a suitable management of the emergency following natural disasters such as floods.

The proposed approach was tested on the study area in the city of Potenza, southern Italy.