

## **Flood risk assessment using a novel exposure-vulnerability matrices approach**

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The classical approach to flood defence, focused on reducing the probability of flooding through hard defences, has been gradually substituted by flood risk management approach, which accepts the idea of coping with floods, and aims at reducing both probability and the consequences of flooding. In this view, the concept of vulnerability becomes central, such as the (non-structural) measures for its increment. However, the evaluations for the effectiveness and methods of non-structural measure and the vulnerability are less studied, compared to the structural solutions. In this paper, we adopted the Longano catchment in Sicily, Italy, as the case study. The methodology developed in the work enabled a qualitative evaluation of the consequences of floods, based on a crisscross analysis of vulnerability curves and classes of exposure for assets at risk. A GIS-based tool was used to evaluate each element at risk inside an Exposure-Vulnerability matrix. The construction of an E-V matrix allowed a better understanding of the actual situation within a catchment and the effectiveness of non-structural measures for a site. Referring directly to vulnerability can also estimate the possible consequences of an event even in those catchments where the damage data are absent. The instrument proposed can be useful for authorities responsible for development and periodical review of adaptive flood risk management plans.