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A simplified method for flood risk evaluation at micro-scale level in Benevento city (Southern Italy)

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In the latest decades, the impact of floods has generated an increase of loss of human lives, as well as the interruption of economic activities in the affected areas. In this context, we present an implemented methodology for micro-scale flood risk evaluation that considers direct and tangible damages as a function of the hydrometric height and allows for quickly estimates of the damage level caused by alluvial events. The method has been applied and tested for economic and residential buildings in the town of Benevento (southern Italy), which was hit by destructive floods in the past. As the limitation of this original method is connected to the huge amounts of input data, we tried to overcome this limit by applying a simplified procedure in defining the physical data of buildings (e.g. type of buildings, n° of floors, presence of cellar). More specifically, during data collection on building features, two different criteria were used: 1) data were acquired through a careful field survey, and 2) data were obtained through the topographical database of the Campania region and through the generalization of heights for each type of building. Data obtained using the first criterion result in a highly accurate risk assessment but, at the same time, the method is non-immediate and time-consuming. On the other hand, the second one is more expeditious. By comparison, the two criteria show very similar results and minimal differences, making the generalized data acquisition the most expeditious. In conclusion, the basic method allows estimating highly detailed potential losses for representative buildings categories in the urban context, but involves a higher degree of resolution; the generalised method, instead, thought the simplification of the data, responds to the need of reaching in a short time a damage value extremely similar to the real one.