



Market analysis for economic evaluation of flood damage

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Nowadays the assessment of flood damage has a key role on the study and application of strategies for flood risk mitigation and management. However, flood damage estimation is still affected by errors and uncertainty because of the high number of influencing variables and the complexity of the damage mechanisms. Flood damages are mainly influenced by hydrodynamic factors, such as flood stage, flow velocity, and flood duration. Furthermore, the characteristics of exposed elements, such as, in the case of buildings, the type of structures, the condition, the geometrical features or the number of stories, and last but not least the precautionary measures implemented at different scales. Over the last years, the importance of developing new methodologies for estimating the economic damages caused by floods, has been increasing, especially thanks to the growing awareness of land management and flood risk assessment. Indeed, the estimation of flood damage over a building is based on the ratio the cost of the intervention to repair and the total new replacement cost of a building. This is for instance the approach used by the INSYDE model (a synthetic, probabilistic flood damage model based on explicit cost analysis). This study presents a new approach for the economic assessment of flood damage, and more specifically for the estimation of the economic value of the assets. The approach is based on market data collection and flood damages data collected in past events in Italy considering a total cost of a building obtained by summing the costs of all its elements. The cost analysis examines the regional price list in order to establish a parameter for the cost of each item, which is evaluated considering previous research and the price quotations for the area. Thus defined the relative damage, it can fit with market values of the properties. This value is calculated with a mass appraisal and is defined through research of the real estate market and historical data. The whole model structure is designed to be transparent and flexible, allowing its application in different geographical areas and to several risk and vulnerability variables. Reaching so the absolute damage, it is possible to construct the absolute damage curves, also analyzing the monetary values. However, when adopt relative damage curves, the results in terms of relative loss, must be multiplied by the market values, to get a quantitative assessment of the risk in financial terms. In order to evaluate the performance of the proposed procedure, a real case study has been implemented.