

Application of the Flood-IMPAT procedure in the Valle d'Aosta Region, Italy

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Flood Risk Management Plans (FRMPs) established by European “Floods” Directive (Directive 2007/60/EU) to Member States in order to address all aspects of flood risk management, taking into account costs and benefits of proposed mitigation tools must be reviewed by the same law every six years. This is aimed at continuously increasing the effectiveness of risk management, on the bases of the most advanced knowledge of flood risk and most (economically) feasible solutions, also taking into consideration achievements of the previous management cycle.

Within this context, the Flood-IMPAT (i.e. Integrated Meso-scale Procedure to Assess Territorial flood risk) procedure has been developed aiming at overcoming limits of risk maps produced by the Po River Basin Authority and adopted for the first version of the Po River FRMP.

The procedure allows the estimation of flood risk at the meso-scale and it is characterized by three main peculiarities. First is its feasibility for the entire Italian territory. Second is the possibility to express risk in monetary terms (i.e. expected damage), at least for those categories of damage for which suitable models are available. Finally, independent modules compose the procedure: each module allows the estimation of a certain type of damage (i.e. direct, indirect, intangibles) on a certain sector (e.g. residential, industrial, agriculture, environment, etc.) separately, guaranteeing flexibility in the implementation.

This paper shows the application of the Flood-IMPAT procedure and the recent advancements in the procedure, aiming at increasing its reliability and usability. Through a further implementation of the procedure in the Dora Baltea River Basin (North of Italy), it was possible to test the sensitivity of risk estimates supplied by Flood-IMPAT with respect to different damage models and different approaches for the estimation of assets at risk. Risk estimates were also compared with observed damage data in the investigated areas to identify the most suitable damage model/exposure assessment approach to be implemented in the procedure. In the end, the procedure was adapted to be applied at the micro-scale, in such a way to supply risk estimates, which are coherent with those at the meso-scale. This way the procedure can be first implemented in the whole catchment to identify hotspots; the micro-scale approach can be implemented in a second run to investigate in depth (i) the most risk prone areas and (ii) the possible risk mitigation strategies.