

Flood scenarios: an introduction to financial and insurance perspectives

To cope with the flooding hazard, a variety of mitigation actions can be put in place: from the improvement of monitoring and alert systems to the development of hydraulic structures, throughout land use restrictions, civil protection, financial and insurance plans. All of those viable options present social and economic impacts, either positive or negative, whose proper estimate should rely on the assumption of appropriate – present and future – flood risk scenarios: a quantitative event description in terms of i) the flood hazard, with its probability of occurrence, extension, intensity, and duration, ii) the value of the exposed elements and iii) their vulnerability. It is therefore necessary to identify proper methodologies, able to describe the chief aspects of the involved physical processes and their spatial dependence.

A Flood Insurance Risk Management Integrated System (SIGRA)

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The Italian National Association of Insurance Companies (ANIA) has recently financed a project with the aim to develop a Flood Insurance Risk Management Integrated System, known as SIGRA. Based on the knowledge of the insured portfolio, the system is able to perform a variety of insurance and re-insurance related quantitative economic analyses. Within SIGRA, flood maps are used to identify hazard prone areas, to provide vulnerability estimates, and as a basis to simulate flood scenarios areal extent. For each location recognized as prone to flood, as well as for each ensemble of risks (i.e., portfolio), SIGRA is able to produce physically realistic flood scenarios that take into proper account flood maps information produced with reference to the different return periods. The system is therefore able to simulate the release of hydraulic forces, which will affect and cause damages to properties located in flood prone areas. Finally, SIGRA estimate insurance and re-insurance related economic parameters as the Annual Expected Loss, the Possible Maximum Loss and the Maximum Possible Loss.