# Integration of natural hazards, risk, and climate change into spatial planning practices

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In search of appropriate instruments for mitigating impacts of natural hazards and climate change, as well as risks, the integration of these factors into spatial planning practices is constantly receiving more attention. Presently, the focus of most approaches lies on single hazard and climate change mitigation strategies. The current paradigm shift from mitigation to adaptation is supported by several project activities that focus on natural hazard and climate change adaptation concepts for regional development. Of great importance in the stakeholder communication process is the definition and applicability of the terms *natural hazard*, *vulnerability*, and *risk*. Risk concepts are manifold and complicated and their application in spatial planning has to be analysed most carefully.

Currently, the linkages from both natural hazards and climate change to planning and decision-making are not well developed. For example, climate change adaptation and natural hazards entered European regional policy relatively recently but are rapidly growing in importance. The new Territorial Agenda of the European Union mentions hazard-related risk management as the key role in European regional development. On a European scale, projects related to natural hazards, climate change, and regional development, conducted under the European Spatial Planning Observation Network (ESPON) and in cooperation with the INTERACT initiative have supported the development of risk-oriented policy recommendations (www.gtk.fi/projects/espon) and the Evidence document of the Territorial Agenda.

On regional and local scale, the Baltic Sea Region's INTERREG IIIB projects SEAREG and ASTRA used climate change scenarios to develop local climate change impact scenarios. The scenarios comprise, for example, sea-level rise and changing flood prone areas, which are analysed in interdisciplinary cooperation. The communication process developed under the SEAREG project resulted in a set of tools that bridges the gap between climate change scenarios and spatial planning by specifically addressing integrated scenario interpretation and uncertainty issues, the so-called Decision Support Frame (DSF – www.gtk.fi/slr). The DSF uses GIS applications and models, but these are only one part of the entire DSF process. The other pillars of the DSF contain a vulnerability analysis, a knowledge base, and a discussion platform. The vulnerability assessment and the discussion platform particularly focus on the communication process and thus distance the DSF from pure computer-based decision-making. Both the vulnerability analysis and the discussion platform do not only help to identify the specific stakeholders to be addressed, but seek to identify and clarify climate change impacts, with the aim of taking uncertainties into account in decision-making processes. The SEAREG approach is successfully developed further by the ASTRA project (www.astra-project.org). For example, some of the cities and municipalities in the Baltic Sea Region have already taken decisions on future land use, which were directly derived from the results of the SEAREG and ASTRA projects.