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## Learning from the past for strategic decision-making in climate risk management: Connecting historic and future adaptation pathways

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Hydro-metrological events cause substantial economic damage and social disruption in our society to date. These climate-related risks will become even more severe in the future, driven by changes in the frequency and magnitude of natural hazard events, an increasing exposure of buildings or infrastructure, as well as vulnerability and resilience developments of residents and businesses. Although these long-term developments are of major social and economic relevance, decisions in disaster risk management and their (potential) impacts are typically assessed as singular events and potential alternative solutions, which have not been considered, are out of scope. Recent research therefore suggests to employ the concept of iterative climate risk management (CRM), in order to align disaster risk management and climate change adaptation policy and practice. This is supposed to increase the awareness of how complex and dynamic the challenge of comprehensively tackling climate-related risks is.

Pathways aims to fill this gap by analysing the long-term development of past and future decisions. The arenas in which these decisions are made are characterised by (1) competing interests from various policy areas, (2) ad-hoc decisions often taking precedence over strategic planning for long-term CRM, and (3) previous decisions providing carry-over, follow-up or creating even lock-in effects for later decisions. Focusing on two climate-adaptation regions in Austria (so-called KLAR!-regions), Pathways paints a comprehensive picture of how local adaptation pathways were developed in the past, how these pathways led to specific decisions at specific points in time, and which impacts these choices had on community development with respect to the choices and pathways not taken. Pathways learns from the past to inform the future with the aim to provide capacity building at the local level. By understanding how earlier decisions enabled or constrained the later decisions, pathways offers policy guidance for making robust decisions in local CRM.

Pathways applies a mixed-method approach to integrate quantitative and qualitative social science research methods and to triangulate the research objectives from different perspectives. Semi-structured interviews with key CRM actors at various levels of government, geo-spatial analysis, secondary analysis of census data and archival research jointly inform the reconstruction of past decision points and related pathways. This approach allows to test, compare, confirm, and control the collected data and the interpreted results from different perspectives, while avoiding

narrow, oversimplifying explanations. Building on the lessons learnt from the past, future pathways are co-designed with local stakeholders in Formative Scenario workshops. Pathways restricts its scope to climate-related risks from extreme hydro-meteorological events and geological mass movements, such as riverine floods and pluvial torrents, mud and debris flow, landslides or avalanches. This risk domain requires governance structures for immediate response to the disaster as well as for prevention and relief/reconstruction. Pathways aims to improve the knowledge base for respective governance efforts.