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Perceptions on intolerable climate-related risks and potential limits to adaptation in Austria

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The focus on adaptation to climate change within policy and research has increased over the last decades. Although the adaptation of human societies to a changing environment is nothing new, the accelerated rate of anthropogenic climate change and the resulting increased frequency and intensity of natural hazards raise new questions regarding the effectiveness of adaptive measures, and whether limits to adaptation could be reached. Adaptation limits are defined by the IPCC as the point at which an actor's objectives (or system needs) cannot be secured from intolerable risk through adaptive actions. They are highly context-dependent and can be financial, technical or biophysical, but are also rooted within beliefs, knowledge, or norms and values. Reaching an adaptation limit means going beyond the adaptive capacity of an actor or system. Adaptive capacity is influenced by the awareness of policymakers and decision makers for the need to act, making it important to understand their perceptions on climate change and adaptation measures in order to identify limits to adaptation. The research project "TransLoss" aims to provide empirical policy-relevant scientific insights into climate-related risks "beyond adaptation" that may play a role in Austria now and in the future, and their influence on society and the natural environment.

We carried out semi-structured interviews (n=26) with Austrian experts from research, policy and practice to identify main sources of concern related to climate-related risks and possible factors impeding adaptation. The interviews were analysed using Qualitative Content Analysis (QCA) and coded into categories identifying the most relevant hazards and sectors which are perceived to be most impacted, as well as factors increasing vulnerability and exposure. Possible adaptation limits were divided into groups according to whether they are biophysical, technical, financial, knowledge-related, or value-related. Mentions of cooperation with other institutions and relevant projects were mapped and offer an insight into the stakeholder landscape dealing with disaster risk reduction and climate change adaptation in Austria.

Scenarios of intolerable climate-related risks and impacts (such as loss of life) described by the interviewees are frequently related to water availability and supply. Large-scale floods from extreme precipitation or the bursting of dams, heat stress triggering impacts on protection forests and loss of agricultural production, and "chain reactions" (or systemic risks) caused by blackouts, which affect multiple sectors, may also lead to intolerable impacts. Measures which could prevent

the breaching of adaptation limits and reduce losses and damages include more restrictive hazard zoning and increased cooperation between interest groups (e.g. farmers, foresters, municipalities, citizens, different levels of administration), for example through more interdisciplinary networks and consultations regarding adaptation measures. More awareness-raising for climate change among policymakers and society is needed, as well as shifting more responsibility on households for private risk reduction. This could for instance be achieved through compulsory climate-related hazard insurance, increased financial contributions when benefiting from protective measures or reduced financial support after a hazardous event.