

Major levers in climate change adaptation in Austria (A-LEVERS)

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April 4 @ Klimatag

- ACRP 15th Call Text (2022)

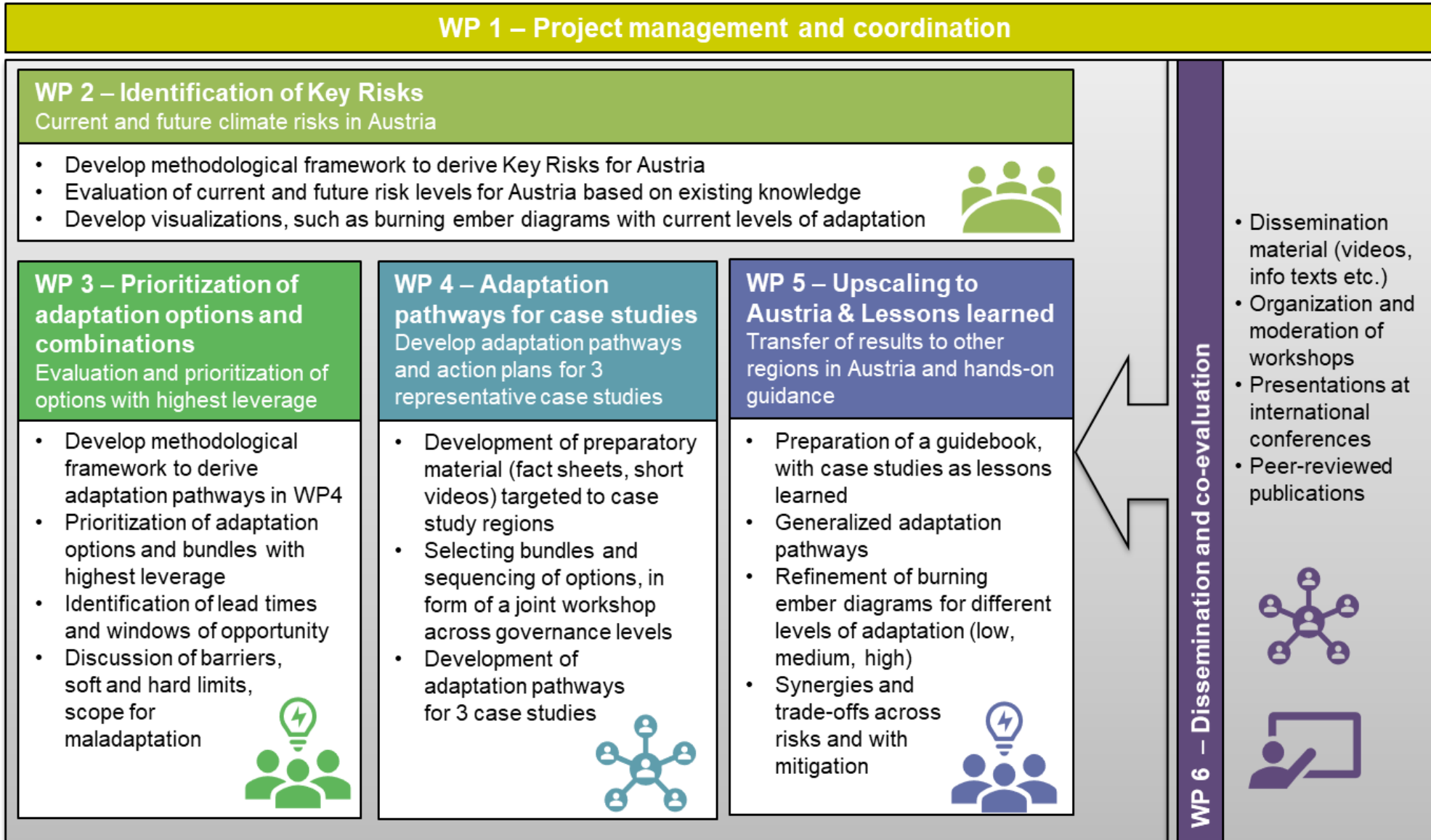
• **Major levers in climate change adaptation:** In order to achieve the most effective and successful climate change adaptation possible, it is important to identify the crucial levers and to determine which adaptation measures are particularly effective, quickly take hold and have a major impact. What are the 10 most effective key measures of climate change adaptation and the reasons for their effectiveness? In which areas are the best levers to be found (policy, infrastructure, disaster management, etc.)? What examples or analogies exist for these measures and how can they effectively be implemented in the long term?



Which measures or bundles of measures should be prioritized for implementation because they are particularly effective and feasible and therefore have the greatest lever?

1. **To identify key risks for Austria**, in strong coordination with the ongoing Second Austrian Assessment Report (AAR2) and **using the burning ember methodology** devised for IPCC AR6 WGII Chapter 16 (O'Neill et al., 2022; Zommers et al., 2020)
2. **To co-develop adaptation pathways** (Haasnoot et al., 2013, 2020) with local adaptation stakeholders for three representative case study regions in Austria, discussing which sequence of adaptation bundles provide the best adaptation lever and why, considering existing path dependencies (Hanger-Kopp et al., 2022; Seebauer et al., 2023)
3. **To develop a hands-on guidance** (Leitfaden) on how this combined burning-ember – adaptation pathways approach can be transferred to other adaptation regions in Austria and beyond

A-LEVERS: Project Structure



Identification and Clustering of Key Risks



WP 2 – Identification of Key Risks Current and future climate risks in Austria

- Develop methodological framework to derive Key Risks for Austria
- Evaluation of current and future risk levels for Austria based on existing knowledge
- Develop visualizations, such as burning ember diagrams with current levels of adaptation

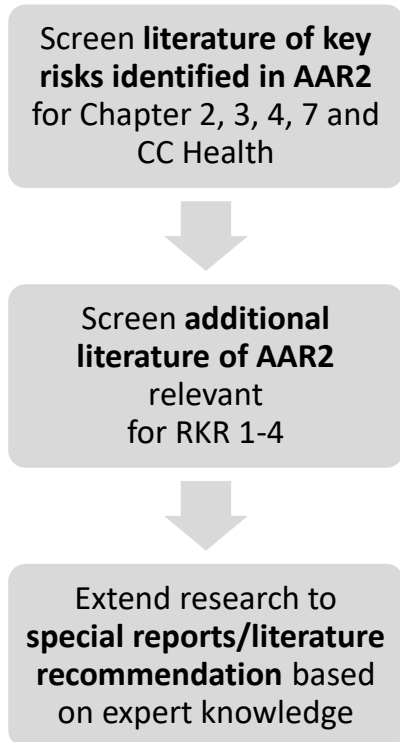


IPCC AR6 WGII: clustering by hazard

1. Mortality and morbidity of people and ecosystems disruptions due to heat
2. Loss in agricultural production due to combined heat and droughts
3. Water scarcity across sectors
4. impacts of floods on people, economies and infrastructure

EU Climate Risk Assessment: clustering by policy sector/system

1. Ecosystems
2. Human health
3. Food
4. Economy and trade
5. Infrastructure



IPCC WGII AR6 ch. 13 Europe Representative Key Risks AUSTRIA

Mortality and morbidity of people and ecosystems disruptions due to heat
(KR1: heat) Mortality and morbidity of people due to heat

Loss in agricultural production due to combined heat and droughts
(KR2: agriculture) Loss in agriculture and **forestry and ecosystem disruptions** due to combined heat and droughts

Water scarcity across sectors
(KR3: water scarcity) Water scarcity, **including lack of snow, to tourism and other economic sectors (energy, industry, water supply)**

Impacts of floods on people, economies and infrastructure
(KR4: flooding) Impacts of **riverine and pluvial floods and mass movements (or: extreme weather events?)** on people, infrastructure and the economy

Procedure for deriving Burning Embers for Austria



- 1. Final agreement on Representative Key Risks (RKR) for Austria: April 3, 2024**
- 2. Expert team: 3-5 experts per RKR (1-2 LAs/CAs, 1-2 A-LEVERS team members, 1 CLA)**
 - Select 10-15 key references per Key Risk
 - Extract risk information from available key references (~10 used) (done by 1-2 team members): April 15, 2024
- 3. First online consolidation meeting: assess risk levels without/low adaptation per RKR: April 2024**
 1. Each expert orders risks in ascending order
 2. Afterwards agree on transition zones [GWL ranges] between risk levels
- 4. Facilitator/expert prepares first version of burning ember diagram; sends out to RKR team**
- 5. Second online consolidation meeting across Key Risks: May 2024**
 1. Final agreement on burning embers without/low adaptation
 2. Consistency across Key Risks
- 6. All information converted to supplementary tables for traceability: May/June 2024**

Next steps: Prioritization of adaptation options

WP 3 – Prioritization of adaptation options and combinations

Evaluation and prioritization of options with highest leverage

- Develop methodological framework to derive adaptation pathways in WP4
- Prioritization of adaptation options and bundles with highest leverage
- Identification of lead times and windows of opportunity
- Discussion of barriers, soft and hard limits, scope for maladaptation



Which (bundles of) measures should be prioritized for implementation because they are particularly effective and feasible (financially, institutionally, in terms of the natural environment, etc.)?

Additional dimensions

- **best possible use of windows of opportunity**
- **consideration of lead times**
- **best timely sequencing of measures**
- **when does a measure reach its adaptation limit?**

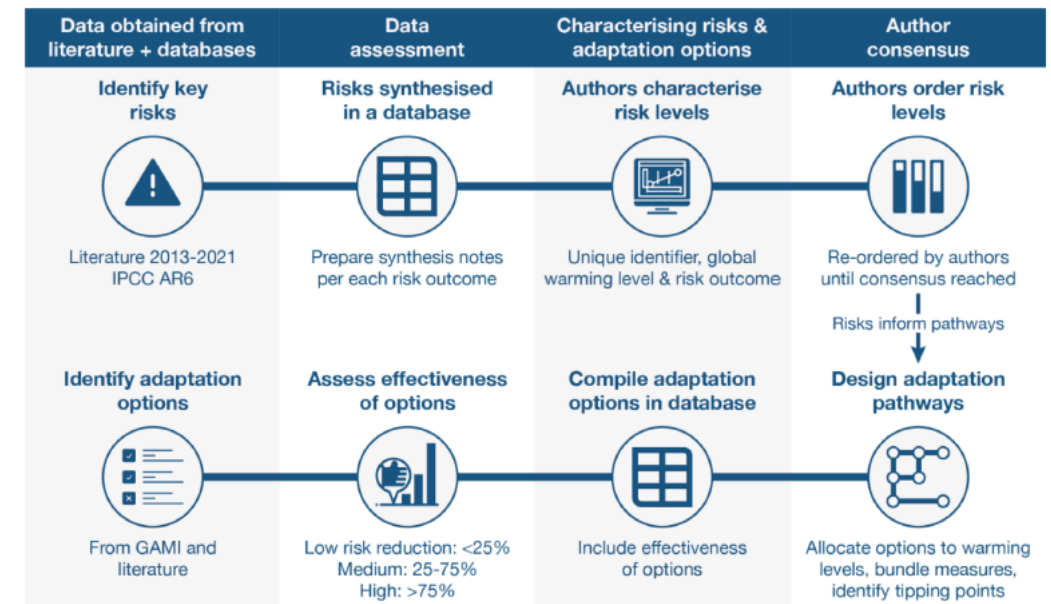


FIGURE 1 Workflow explaining the stages to derive the burning embers diagram (top) and to design the adaptation pathways (bottom). As studies in the literature are not evenly distributed across geography and time, the confidence in the assessment will vary especially in response to high warming and uncertainty in the literature.

Next steps: Adaptation Pathways for case studies



WP 4 – Adaptation pathways for case studies

Develop adaptation pathways and action plans for 3 representative case studies

- Development of preparatory material (fact sheets, short videos) targeted to case study regions
- Selecting bundles and sequencing of options, in form of a joint workshop across governance levels
- Development of adaptation pathways for 3 case studies



Gradient from urban to rural, prevalence of different climate hazards, and different systems at risk.

1. The **KLAR region StadtLandSee!** lies in the alpine foreland and consists of two medium-sized cities and two rural alpine municipalities, with heavy precipitation and mass movements as main hazard. The region is currently in the initiation phase of the KLAR! program and will start the implementation phase in autumn 2023.
2. The **KLAR region Retzer Land** is a rural region in the northeastern lowland consisting of 6 municipalities. The main economic activity is agriculture, specifically wine growing. Within an already relatively arid area, the challenges for adaptation are large. The region has currently started its implementation phase of the KLAR program in which new adaptation projects should be started and the adaptation strategy revised.
3. The **city of Linz** is Austria's third largest city (with ~ 250,000 inhabitants) and one of the big industrial centers in Austria, facing heat, riverine and pluvial flooding. The city is currently setting up its first adaptation strategy (to be completed in 2024). The adaptation pathways are a natural next step towards implementation.

Project Team



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FORSCHUNG UND PROZESSBEGLEITUNG

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