



Project overview and method

Aim of PACINAS

The project PACINAS (Public adaptation – Investigating the Austrian adaptation strategy) addresses the costs of adaptation to climate change for the public budget and the associated macroeconomic effects. Case studies on city, provincial and federal level made it possible to estimate the current adaptation deficit and the potential future costs of adaptation up to 2050. The project focuses on adaptation costs due to extreme events such as flooding, mass movements and heat stress as well as on activity fields of the Austrian adaptation strategy (BMLFUW, 2012) with high relevance for the public budget (agriculture, forestry, water, protection from natural hazards, catastrophe management, transport, cities and urban green). PACINAS was carried out by the Wegener Center of the University of Graz in cooperation with the Umweltbundesamt, AIT and IIASA.

What is meant by adaptation to climate change?

According to the IPCC, adaptation is understood as the process of adjustment to actual or expected climate and its effects. Adaptation aims to moderate or avert damages for social and economic systems as well as to exploit potential beneficial opportunities. Targeted human action can also facilitate the adjustment of ecosystems to help deal with a changed climate and its impacts (IPCC, 2014).

A broad array of options exist for adaptation: non-technical measures targeted at raising awareness or building capacity; „green“ measures, such as the renaturation of water bodies; or „grey“ measures, such as technical slope stabilization or flood protection structures. When assessing resource requirements for adaptation, one encounters the challenge that adaptation measures are usually not additional or new interventions, and must be integrated into ongoing or planned activities in order to enhance climate resilience.

What is public adaptation to climate change?

Public adaptation comprises all measures (recommendations of actions) that are undertaken or motivated by public authorities at different governance levels. This is the case when

- federal/provincial/municipal authorities are in the role of the owner or are responsible for its management,
- significant social organization is required,
- adaptation undertaken by private actors needs to be facilitated by the provision of public goods,
- there are market, policy or governance failures or behavioural barriers to adaptation (Eakin and Patt 2011, Cimato and Mullan 2010).

In the project PACINAS we differentiate the different phases in the adaptation process: initiation, financing, implementation, and who benefits from the measure (Figure 1). When assessing the 132 measures of the Austrian Adaptation Strategy (BMLFUW, 2012), we find that the initiation is predominantly done by public actors, while financing and implementation is undertaken by private actors to a larger degree. The general public (category „public“) benefits from around half of the measures while the other half is beneficial for specific groups (category „private“ or „mixed“). In PACINAS, we therefore define **public adaptation as all measures that are publicly funded or implemented.**

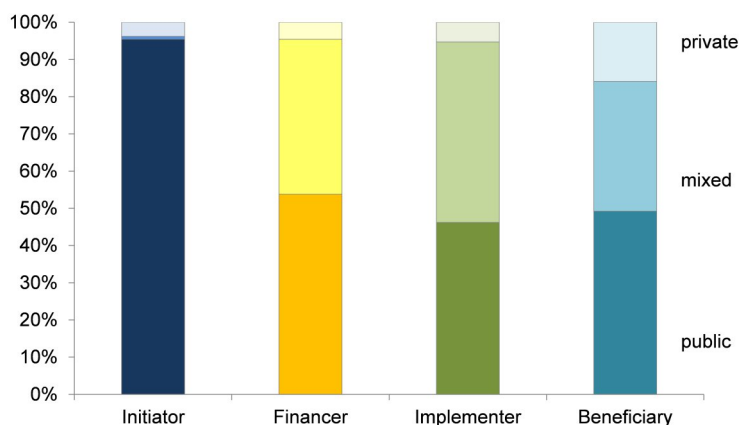


Figure 1: Assessment of the Austrian Adaptation Strategy according to contributions by private, public and mixed actors.

Public: European Union, federal state, provincial states, municipalities, social security, public companies, NGOs; Private: private companies, households; Mixed: both public and private actors.

Source: Knittel & Bednar-Friedl (2016)



The contribution of public actors to adaptation differs by activity field. Figure 2 assigns the 14 activity fields of the Austrian Adaptation Strategy to the following categories: mostly public involvement, mixed public and private involvement or mostly private involvement. Moreover, public adaptation is required at all governance levels: for instance, public authorities at federal, provincial and municipal levels participate in providing support after a flooding event. To reduce potential future impacts of climate change, planned proactive adaptation frameworks are needed.

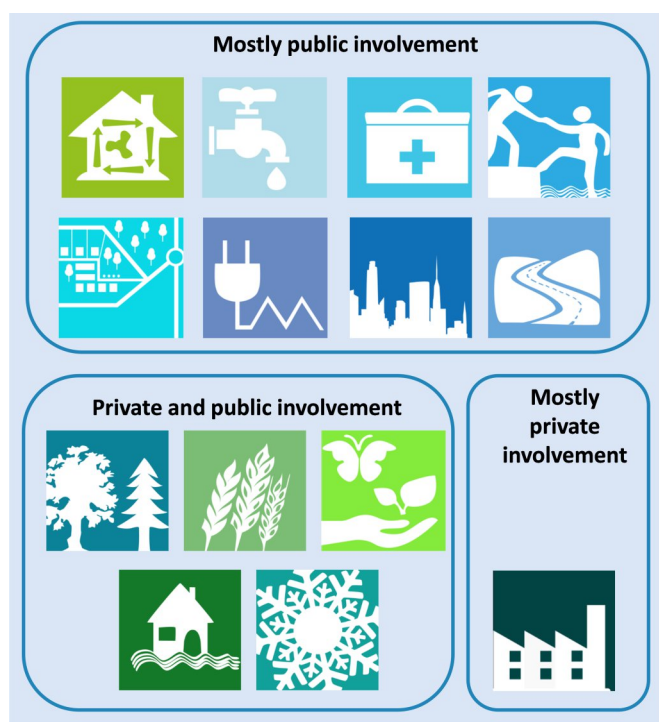


Figure 2: Contributions of private and public actors to the measures listed in the Austrian Adaptation Strategy

Source: Knittel & Bednar-Friedl (2016)

Starting point and methodological approach

Based on the COIN project (Steininger et al., 2015) in which the costs of inaction were assessed for Austria, the PACINAS project investigates the potential costs and benefits associated with public adaptation to climate change. The research starts with the current adaptation deficit, which relates to the impacts of current climate variability and the current early impacts of climate change. For selected activity fields, current and future climate related risks and their economic consequences for the public budget were assessed. During the project, key stakeholders were regularly involved in the identification of ongoing adaptation activities and needs as well as associated costs.

To support decision making in the future, potential adaptation pathways were identified and synergies and trade-offs between private and public adaptation were discussed.

What is the current adaptation deficit?

The current adaptation deficit relates to the impacts of **current climate variability** (periodic variations from the long-term average climate, including extreme events), and the **early impacts of climate change**. In PACINAS, the adaptation deficit is understood as the current and future need for action caused by current climate risks due to early impacts, climate variability and extreme weather events. Due to a lack of a suitable attribution methodology, the contribution of climate change to natural disasters and their consequences cannot be quantified. Using the adaptation deficit as the starting point, we derived first estimates of “early adaptation” in Austria.

What are adaptation-relevant costs?

Adaptation-relevant costs are expenditures aimed at **avoiding or reducing the impacts** of current climate variability (adaptation deficit) and future impacts of climate change for ecological, social and economic systems as well as **realizing potential opportunities**. Activities supporting this aim are considered “adaptation-relevant” and the resulting expenditures are called “**adaptation-relevant costs**”. Public expenditures and programs that pursue climate change adaptation as a primary goal, are classified as having 100% adaptation costs. However, expenditures on adaptation are usually a by-product of existing programs and actions with other goals such as health or energy supply. *Details on this and additional costing methods can be found in fact sheet #4.*

Key findings

The public sector is involved in almost all activity fields of the Austrian Adaptation Strategy, either by initiating, financing or by implementing the measures.

Adaptation relevant costs comprise expenditures for the consequences of current climate risks as well as expenditures to avoid or reduce future consequences, including the realization of opportunities.

Adaptation expenditures include pro-active as well as reactive adaptation, and measures to build capacity as well as deliver adaptation.

Adaptation is often a part of other ongoing activities and expenditures, for which the primary goal is not adaptation; costs are therefore only partially attributed to adaptation.



Authors: Markus Leitner, Maria Balas, Birgit Bednar-Friedl, Nina Knittel, Thomas Schinko, Gabriel Bachner, Martin König, Natalie Glas
Layout: Astrid Felderer

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