

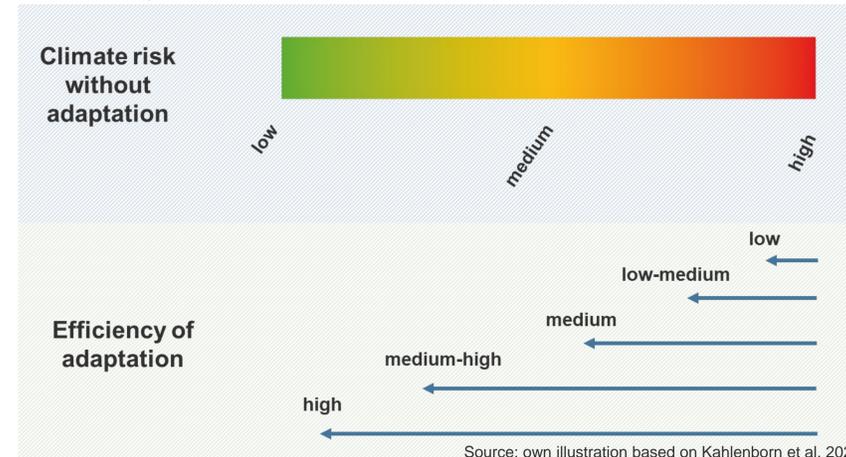
Limits of nature-based solutions to act as means to adapt to climate change – Results from the German Climate Impact and Risk Assessment

Maike Voss (voss@adelphi.de), Luise Porst, Walter Kahlenborn – adelphi research gGmbH

Methodology to assess climate risks and adaptive capacity:

- The climate impact and risk assessment for Germany aims to provide a basis for the next German Adaptation Plan. Assessing the adaptive capacity was the second step in the overall assessment. In a first step, climate risks were assessed disregarding adaptation as an influential factor.
- For the adaptive capacity assessment, experts were asked to estimate how effectively adaptation will reduce climate risks for the time period 2031-2060 for two scenarios of climate change. The results of this expert judgement, drawing on the Delphi method, were the climate risks in consideration of adaptation.

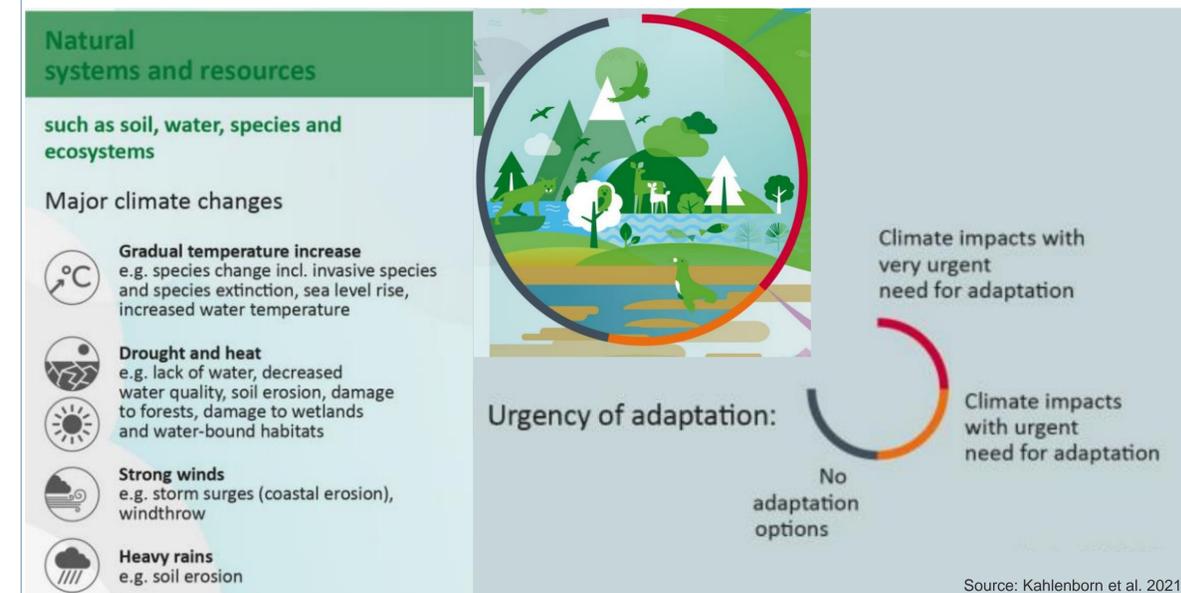
- Individual climate risks were then assigned to five system areas ⁽¹⁾ in order to integrate the sectoral results.



Adaptation is understood as the realisation of adaptive capacity via the implementation of adaptation measures to reduce the sensitivity of an affected system/ influence the spatial exposure. The assessment differentiated six dimensions of adaptive capacity: knowledge, motivation, technological & financial resources, governance and regulatory structures.

Results:

- As the comparatively high number of high climate risks in the realm of natural systems (i.e. (coastal) ecosystems, soil or water resources) shows, that they are highly affected by climate change (85.% RCP8.5 scenario).
- At the same time, adaptive capacity in this system area was found to be comparatively low.



Discussion:

- With natural systems being comparatively highly affected by climate change until the middle of the century, their ability to provide nature-based solutions seems limited. E.g. the wave dampening effect of the Wadden sea is projected to decline with increasing sea level rise; thus it might only be able to act upon a certain extent as natural coastal protection structure.
- (Absolute) Limits to adaptation were also identified with regard to climate risks to biodiversity and soil functions. In case of a strong climate change, several ecosystem functions might, therefore, not be available in the future.
- Under current circumstances, autonomous adaptation of ecosystems might take longer than required to adapt to ongoing climate change. Thus, adaptation measures must aim to strengthen the systems' own abilities to adapt, by both relieving them from existing pressures due to habitat fragmentation, pollution, over-exploitation of resources, amongst others and avoiding a strong climate change scenario by intensifying ongoing mitigation activities and enhancing the efforts taken so far.

German Climate Risk Assessment 2021:



(1): Natural systems and resources, ecosystems that use nature, infrastructure and buildings, ecosystems remote from nature, people and social systems