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Climate services within a regional climate adaptation project

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In recent years the demand for adapting to climate variability and change became more and more obvious. Thus a multitude of projects dealing with climate adaptation strategies and concrete measures was launched. Commonly, developing adaptation options is based on downscaled climate model outputs. These outputs have to be provided within the projects, but just providing the data is far from being sufficient. Obstacles connected with using climate projections for climate adaptation include uncertainties and bandwidths of climate projections and the inability of models to describe parameters such as extreme weather events, which are particularly relevant for many climate adaptation decisions.

Climate scientists know that model outputs are no climate data and cannot be treated as observational data were treated in the past. Still, many practitioners demand precise values for future climate to replace past CLINO-values and to run their applications. Thus, climate adaptation involves adapting the instruments and processes used in deriving climate-related decisions. Communicating the challenges arising from this need in rethinking common procedures is of outstanding significance for any successful adaptation practice.

Dealing with uncertainties of climate projections is a constant necessity, since they are always based on several simplifications, parameterisations and assumptions, e.g., on the future socioeconomic development or on climate sensitivity. Future climate should thus be communicated in bandwidths. Working with just one scenario, one climate model, or even working with ensemble means is risky as it evokes a higher than appropriate perceived confidence in the results. It encourages using familiar tools in processing climate information, rather than caution. Consequences are suboptimal adaption and misallocation of finances. We encourage working with bandwidths and testing climate adaptation options against a broad range of possible future climates.

Climate models are simplifications of the complex climate system. They cannot represent all relevant processes and thus contribute to further uncertainty. The use of model outputs for impact models is often restricted by large model biases and the inability to simulate extreme events. Applying bias correction bears the risk of introducing new uncertainties and even errors in the data set, particularly if the bias is non-stationary. Furthermore, climate elements are often corrected separately, thus compromising the data consistency. Illustrating relative changes within a model simulation instead of showing absolute signals enables the comparison of climate models with different biases.

Adaptation programmes should be flexible enough to implement new scientific results and to fine-tune adaptation measures over different time scales. This requires established networks of decision makers – like public authorities and companies – and of scientists working on climate adaptation and related challenges. Climate adaptation needs to be perceived as a process and not as a result.