

Theme 1: Regional climate research data and information, and gaps

Poster Presentation:

Added value of regional downscaling with COSMO-CLM in the context of CORDEX-Africa

Hans-Jürgen Panitz¹, Alessandro Dosio², Gerd Schädler¹

¹ Karlsruhe Institute of Technology, Germany; ² European Commission Joint Research Centre, Ispra, Italy

Short Statement and its relation to the guiding questions:

The key messages from the poster and further work, done by members of the CLM-Community within CORDEX, are that regional climate models (RCMs) like COSMO-CLM

- are better suited to assess climatology, extremes and climate indices than global models,
- thus, can help to identify most vulnerable regions for more focused and better informed planning of adaptation and mitigation measures under climate change conditions,
- can provide very high resolution (< 10 km), physically consistent data needed by impact models.
- However, assessment of robustness of results needs multi-model ensemble approach and more long-term and reliable observations for model evaluation and improvement

These key messages also relate to the guiding questions for this dialogue:

(a) What is the regional coverage of observational climate data for research, and what are the gaps?

- Only a few long-term (> 30 years) climatological observations are available. Generally, they have rather low spatial and temporal resolution, diverging data
- There is a need also for other observations than near surface temperature and precipitation (e.g. agriculture and energy related quantities: soil moisture, evapotranspiration, insolation, cloudiness, climate indices, extremes,...)
- Observational networks have to be setup, at least in the most critical regions of Africa.
- Regional climate projections could help identifying them.

(b) What scientific information is available to support mitigation, and adaptation and NAPs?

- COSMO-CLM results are one example of a variety of RCMs results achieved within CORDEX
- Knowledge whether relevant information can be extracted from the data needs the interface to stakeholders

(c) What scientific information on downscaling is available for provision of regional and national scale climate scenarios?

- Rather comprehensive amount of data available through CORDEX
- Altogether, eight groups provide climate projection data for Africa on the Earth System Grid Federation (ESGF) servers, applying different RCMs (altogether 6) driven by different GCMs (altogether 12) under different realizations and emission scenarios .
- Gaps: need of interface to stakeholders, need of detailed ensemble analysis, need of higher resolution for extremes

(d) What activities are in place to provide and strengthen regional and national climate services, and what are the gaps?

- RCMs like COSMO-CLM have the potential to be extended to a regional Earth System Model (ESM)
- This requires a comprehensive adaption and validation process
- However, regional ESMs will be expensive to operate
- “order” (very high resolution) simulations for specific issues in specific regions?
- There is a need of adapted impact models
- How precise must the information be?