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Model based climate information on drought risk in Africa

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The United Nations World Food Programme (WFP) has embarked upon the endeavor of creating a sustainable Africa-wide natural disaster risk management system.

A fundamental building block of this initiative is the setup of a drought impact modeling platform called Africa Risk-View that aims to quantify and monitor weather-related food security risk in Africa.

The modeling approach is based the Water Requirement Satisfaction Index (WRSI), as the fundamental indicator of the performances of agriculture and uses historical records of food assistance operation to project future potential needs for livelihood protection.

By using climate change scenarios as an input to Africa Risk-View it is possible, in principles, to evaluate the future impact of climate variability on critical issues such as food security and the overall performance of the envisaged risk management system. A necessary preliminary step to this challenging task is the exploration of the sources of uncertainties affecting the assessment based on modeled climate change scenarios.

For this purpose, a limited set of climate models have been selected in order verify the relevance of using climate model output data with Africa Risk-View and to explore a minimal range of possible sources of uncertainty.

This first evaluation exercise started before the setup of the CORDEX framework and has relied on model output available at the time. In particular only one regional downscaling was available for the entire African continent from the ENSEMBLES project.

The analysis shows that current coarse resolution global climate models can not directly feed into the Africa RiskView risk-analysis tool. However, regional downscaling may help correcting the inherent biases observed in the datasets.

Further analysis is performed by using the first data available under the CORDEX framework. In particular, we consider a set of simulation driven with boundary conditions from the reanalysis ERA-Interim to evaluate the skill drought risk assessment approach compared to available historical records.

This work highlights the potential impact of the CORDEX initiative in critical sectors of climate risk management.