



## **Challenges and possibilities for attribution studies in developing countries: Ethiopian drought of 2015**

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Few publicly available observational stations, irregular records and short time series are common obstacles to trend detection and event attribution in developing countries (and in general, data sparse regions). It is developing countries, however, that also feel the impact of extreme weather events most severely and are therefore most vulnerable to climate change. There is a clear need for objective studies that quantify the extremity of the events and investigate their cause, which can be used in raising risk awareness.

Here we outline our multi-method approach, which can help to indicate whether event return times and the attribution are robust and give a fairer idea of uncertainties, using the drought of 2015 in Ethiopia as an example, and share the challenges and possibilities encountered. In a drought-free year, Ethiopia experiences two rain seasons, Belg from February to May, and Kiremt from June to mid-September. In 2015, both rain seasons failed in the north east of the country, leading to one of the lowest precipitation deficits there in at least 50 years. We discuss the steps involved in defining the event, selecting precipitation and soil moisture as indicators for drought and its impact, and selecting observational data and other sources that can be used in addition to station observations, like the CHIRPS and CenTrends datasets. Besides we show the importance of using different models that are validated well, as well as the chosen approach to trend detection and attribution to both global warming and El Niño.