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Is the Indian Ocean Dipole more important than El Niño–Southern Oscillation for flood risk in Sub-Saharan Africa?

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In Sub-Saharan Africa (SSA), river flows have significant seasonal and inter-annual variability with strong flood and drought extremes which threaten the lives of millions of people every year.

The high variability in river flow can often be linked to variability in patterns of Sea Surface Temperature (SST). Among the SST patterns, the El Niño–Southern Oscillation (ENSO) in the Pacific Ocean is commonly used as the trigger for mobilising preparedness activities.
Despite this, recent studies have suggested a paramount impact of the Indian Ocean Dipole (IOD) on rainfall anomalies in parts of SSA, but there are a lack of studies which quantify the impact of different teleconnections (ENSO, IOD and other SST modes) in terms of flood hazard.

Using flood frequency analysis techniques, we investigate which teleconnections are the most important predictors for flood frequency and magnitude across SSA. Our first results show that for large parts of SSA the likelihood of flood hazard is affected more significantly by IOD than ENSO.
We assessed these links by using streamflow time series produced by the Global Flood Awareness System (with LISFLOOD and CaMa-Flood routing models) driven by the Era-Interim/Land meteorological reanalysis (1980–2010) and ERA-20CM climatological reconstruction (1901-2010) by ECMWF. For the SST patterns, we used time series from ERA-20CM and observations to calculate indices.