



Using the Standardized Precipitation Index (SPI) for Drought Monitoring over Africa

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The Standardised Precipitation Index (SPI) is a statistical indicator evaluating the lack or surplus of precipitation over different time scales. Thus it allows distinguishing contemporary wet conditions on one time scale from dry conditions on another time scale, a concept, which is often difficult to convey to decision-makers. This concept further allows distinguishing time-related impacts of the moisture deficit, for example on agricultural production (soil moisture), surface hydrology (run-off), groundwater, and economy.

SPI is calculated as a function of the long-term average precipitation, using continuous, long-term series of historic accumulated monthly precipitation records. Since rainfall is not normally distributed for aggregation periods of less than 12 months a gamma distribution is fitted to the frequency distribution. The SPI for a given rainfall amount is then given, in units of standard deviation, by the precipitation deviation from the mean of an equivalent normally distributed probability distribution function with a zero mean and a standard deviation of one.

As a consequence, wetter and drier climates and periods can be represented and monitored in the same way.

For this study, SPI has been calculated for time-scale periods of 3, 6, 9 and 12 months at two spatial scales: (a) over Africa, using 1.0 degree precipitation grids from the Global Precipitation Climatology Project (GPCP); (b) over the Horn of Africa using local point precipitation measurements, interpolated to a 0.25 degree grid.

Both SPI datasets have been compared in a selected common time period. First preliminary results demonstrate the feasibility of using SPI for drought monitoring at continental and regional scales over Africa.