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Drought hazard mapping in Africa: preliminary results

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Drought differs from other natural hazards in many ways. Important differences include the nature of its development and the progressive impacts. Unlike for a flood or an earthquake, the beginning and the end of a drought episode is not readily determinable and the impacts of a drought accumulate slowly during a certain period of time and may persist for months or years even after the end of the drought event. Another important issue that needs to be faced when monitoring drought is the lack of direct measurement possibilities of the phenomenon. This is due, on the one hand, to the absence of a precise and universally accepted definition of drought and, on the other hand, to the fact that impacts of drought are non-structural, which makes it difficult to accurately assess drought severity.

Analyzing drought hazard is a key element for drought risk assessment and an important aspect for regional development planning in Africa. In this research the Standardized Precipitation Index (SPI) has been used as a reference index for the identification of drought events. SPI is based on precipitation only and as such usable also in relatively data-scarce regions provided precipitation data is available. It is a statistical indicator evaluating the lack or surplus of precipitation during a given period of time as a function of the long-term average precipitation and its distribution. It is calculated using a continuous, long-term (more than 30 years) series of historic precipitation records. This index can be estimated over different periods of time (3, 6, 9, 12 months). Depending on the length of the period, different drought impacts from agricultural (i.e. soil moisture) to hydrological (i.e. surface flow, groundwater recharge) can be identified.

A specific methodology has been developed to identify and count drought events. The final products consist of maps covering the African continent at 0.5 deg. resolution representing: (i) Frequency of severe drought and (ii) Mean Duration of severe drought. By combining both products, return interval and mean duration, areas with higher probabilities to experience long and/or frequent severe droughts can be identified.

During the session, the methodology and results will be presented and discussed for different regions in Africa.