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Development of a Next Generation Drought Index: combining multiple global and local data sources to enable detection of sector-specific drought impacts

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An increasing number of regions and countries are confronted with droughts as well as an increase in water demand. Inevitably, this leads to an increasing pressure on the available water resources and associated risks and economic impact for the water dependent sectors. In order to prevent big drought impacts, such as agricultural damage and food insecurity, timely and focused drought mitigation measures need to be carried out. To enable this, the detection of drought and its sector-specific risks at early stages needs to be improved. One of the main challenges is to develop compound and impact-oriented drought indices, that make optimal use of innovative techniques, satellite products, local data and other big data sets.

Here, we present the development of a Next Generation Drought Index (NGDI) that combines multiple freely available global data sources (eg. ERA5, MODIS, PCR-GLOBWB) to calculate a range of relevant drought hazard indices related to meteorological, hydrological, soil moisture and agricultural drought (eg. SPI, SPEI, SRI, SGI, VCI). The drought hazard indices are aggregated at district level, while considering the percentage area exposure of the drought impacted sector (exposure). In addition, the indices are enriched with local and national scale drought impact information (eg. online news items, social media data, EM-DAT database, GDO Drought news, national drought reports). Results are presented at sub-national scales in interactive spatial and temporal views, showing the combined drought indices and impact data.

The NGDI approach is being tested for the agricultural sector in Mali, a country with a vulnerable population and economy that faces frequent dry spells which heavily impact the functioning of the important agricultural activities that sustain a large part of the population. The computed drought indices are compared with local drought data and an analysis is made of the cross-correlations between the indices within the NGDI and collected impact data.

We aim at providing the NGDI information to a broad audience as well as co-creation of further NGDI developments. Hence, we would like to reach out to interested parties and identify collaboration opportunities.