## Dry spells analysis: Multi-scale detection, attribution of impacts and sources of uncertainty using an integrative approach.

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Dry spell (DS) events are well known by farmers to be the rainfall hazards which cause major damages to crops, especially when they occur at crop critical stages. This study extends our understanding of the intra-seasonal distribution of DS in the local and sub-regional rainfall features, depicts their impacts and investigates the attribution of uncertainties using integrative multi-sites observations (87 rainfall stations), ensembles-based simulations of regional climate models (8 RCM ensemble members) and crop models inter-comparison (CERES-millet, SARRAH). The results of this multidisciplinary approach, over the past 61 years (1950-2010) in Senegal, improve the predictability of extreme dry spells and provide evidence of how to optimize model resources for detection and impacts assessments at local scale in the West African Sahel. Key words: Dry spell, Multi-scale characterization, attribution of impact, uncertainty, models intercomparison, Sahel.