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Title: **Annual Characterization of Regional Hydrological Drought using Auxiliary Information under Global Warming Scenario**
Authors : Zulfiqar Ali et al.

GENERAL MAJOR COMMENTS
The paper claims to present a hydrological drought index, which uses improved monthly precipitation estimates under global warming scenario. The monthly station precipitation timeseries are improved using local weights utilizing regression equations between precipitation and temperature. Temperature is treated as an auxiliary variable. The paper proposes a new drought index, the Locally Weighted Standardized Precipitation Index (LWSDI) for drought assessment. LWSDI is applied in ten stations across Pakistan for the period 1970-2017 and LWSDI timeseries are compared at 12-month time scale with the commonly used and well known drought indices SPI and SPEI.

Major Comments

There are many points that should be clarified before considering the paper for publication.

1. The title, abstract and the core of the paper claim that the LWSDI is a hydrological drought index, which is not. However, the time scale of 12-month may suggest that this is a hydrological/water resources drought index. There are many papers that have identify the importance of drought indices time scale in characterizing meteorological and/or hydrological droughts, and the authors should refer to them.
2. The title of the paper (and a few sentences in the Abstract and Introduction) is not appropriate and it does not reflect the research presented. The LWSDI is not a hydrological drought index and the paper does not use an Global Warming Scenario.
3. The various climatic regions of Pakistan should be presented in the "Study Area" section of the paper, since it is claimed that the 10 stations used are representative of these climate regions.
4. It seems that the proposed index is essentially the SPI using locally weighted precipitation. Thus, it is expected that the proposed index LWSDI to compare well with SPI. I suggest that the authors try to analyze specific common and extreme drought events using LWSDI, SPI, SPEI, derive the drought parameters (i.e. drought duration, severity, intensity, etc) for each drought index and compare the results.
5. The authors claim that if a positive linear relationship exists between precipitation and temperature then the proposed method could be applied. However, the relationships for the 10 stations are not presented. These relationships should be presented and thoroughly been discussed, since the methodology is based on these relationships. The discussion of the relationships should be linked with the climatic features of the 10 station locations.
6. The empirical probability distributions of precipitation in the 10 stations should be discussed and the discussion should be linked with the climatology of the regions of Pakistan.

Minor comments

1. There many sentences that need rephrasing. For example:
   a. Page 2. Line 4. "…(SDI) are one of the most …." Please revise – check English
   b. Page 2. Line 30. "Some of them are….." Please revise
   c. Page 3. Line 18. Please correct 20017 to 2017.
   d. Page 4. Line 10. What is "unbiasedness"??? Please rephrase-correct
   e. Page 4. Line 28. "…..by both mathematically and numerically…" Please correct.
      And others.

2. The first two sentences of Abstract and Introduction are the same. Please revise having in mind the major comment #2.
3. Figure 1. Should present the elevation (DEM) of Pakistan. The figure should be a proper map of Pakistan having scale, legend and North symbol.
4. Equation 3. Define F(x) and G(x).

The presented study falls within the scope of NHESS. However, the paper is not ready for publication and needs major revisions before it would be acceptable for publication in the journal of NHESS.