

Supplementary Materials

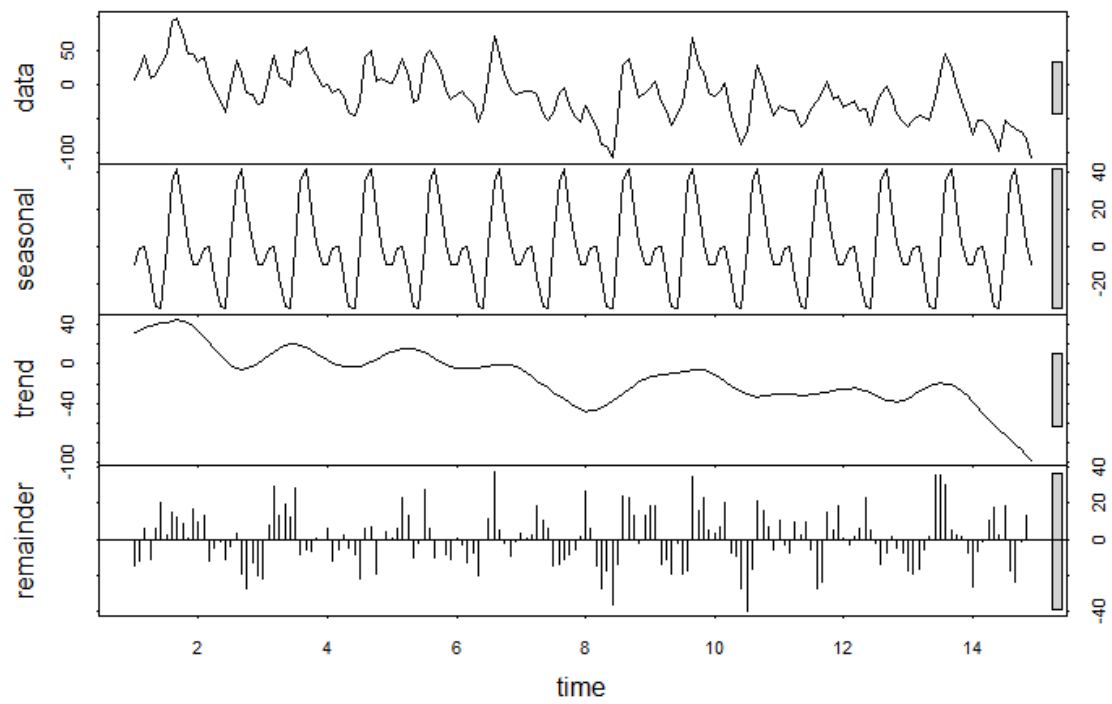


Figure. S1 An example of TWSA time series decomposition into seasonal, trend, and remainder components performed using the STL methods.

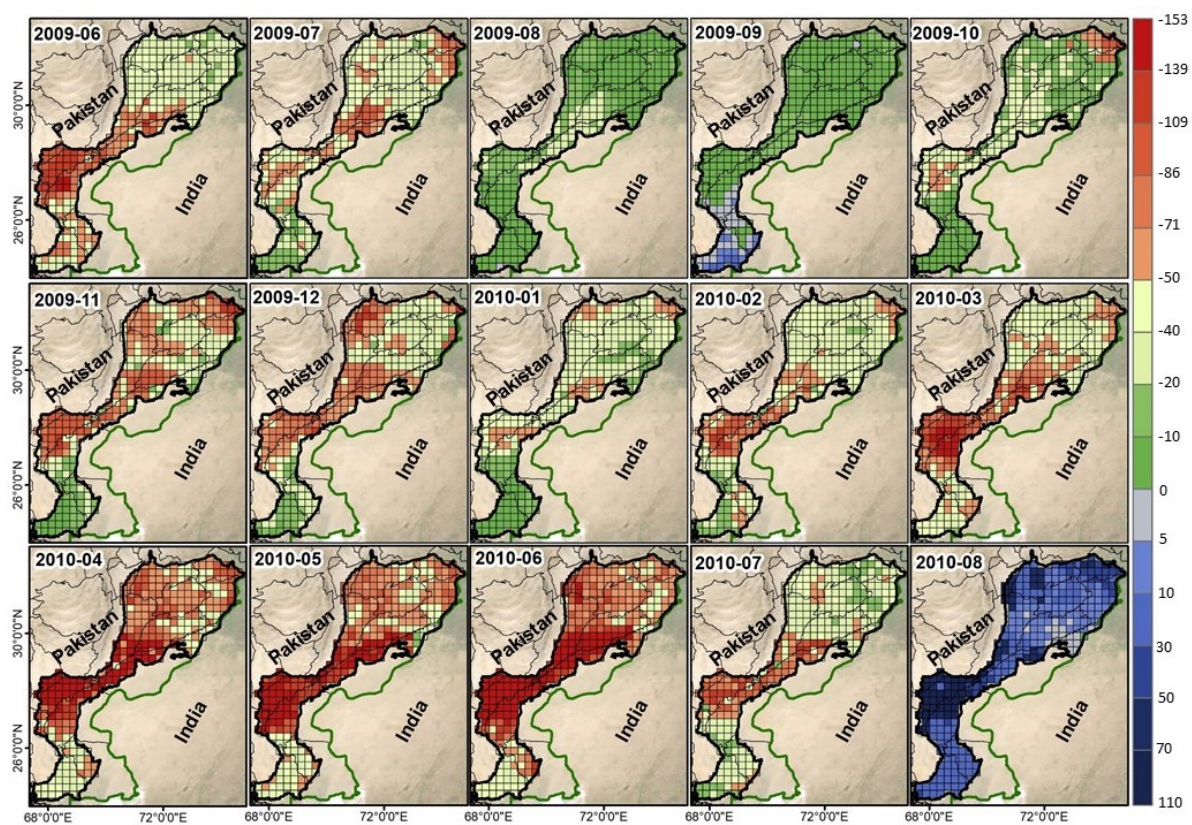


Figure. S2 Spatial distribution of Downscaled TWSA patterns from 2009.06 to 2010.08 in the IBIS.

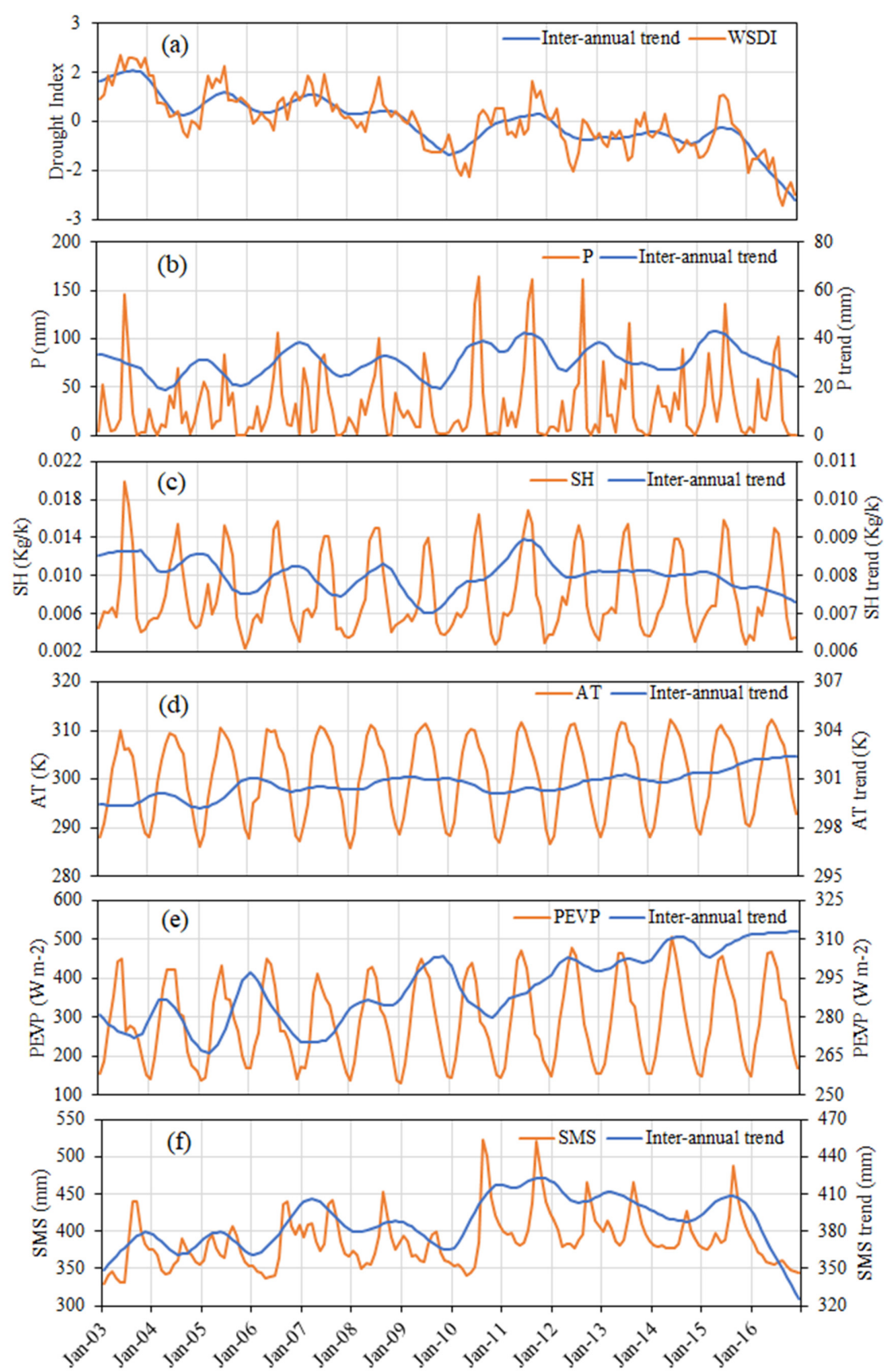


Figure. S3 (a) Comparison between WSDI and inter-annual trend, and (b-f) comparison between STL decomposed inter-annual trends and original data of climatic variables.

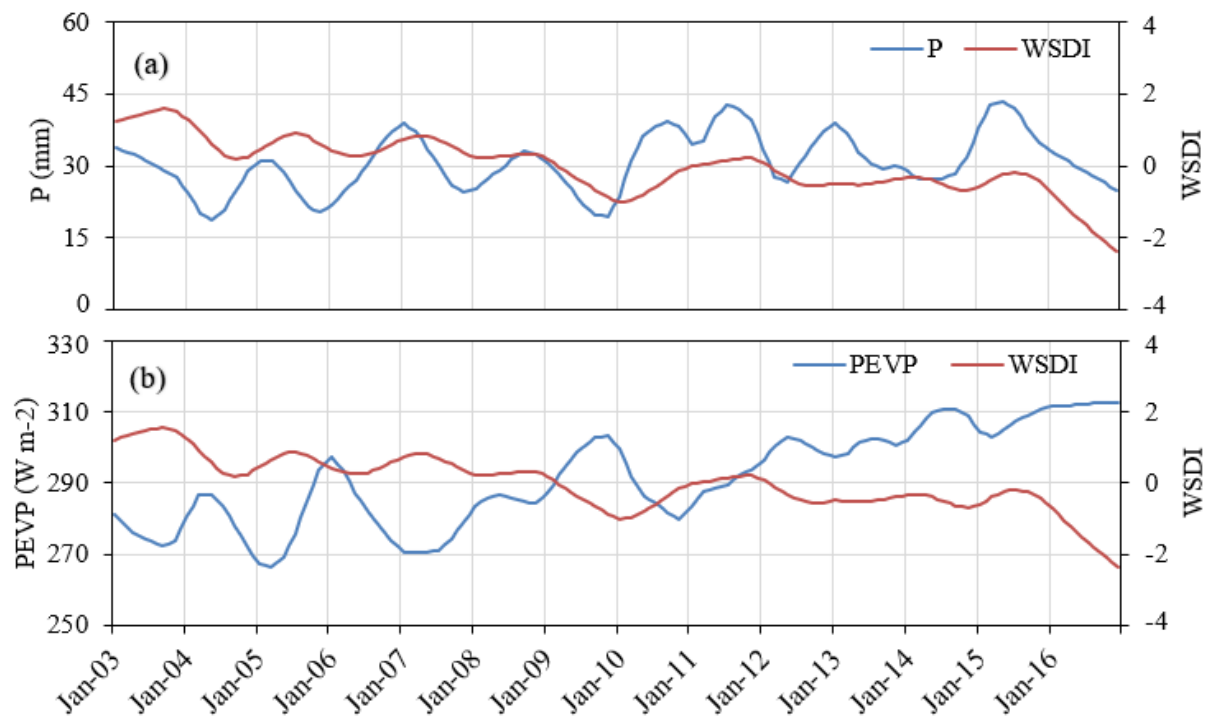


Figure. S4 Comparison of trends between WSDI and climate variables (a) WSDI and precipitation and (b) WSDI and potential evaporation.

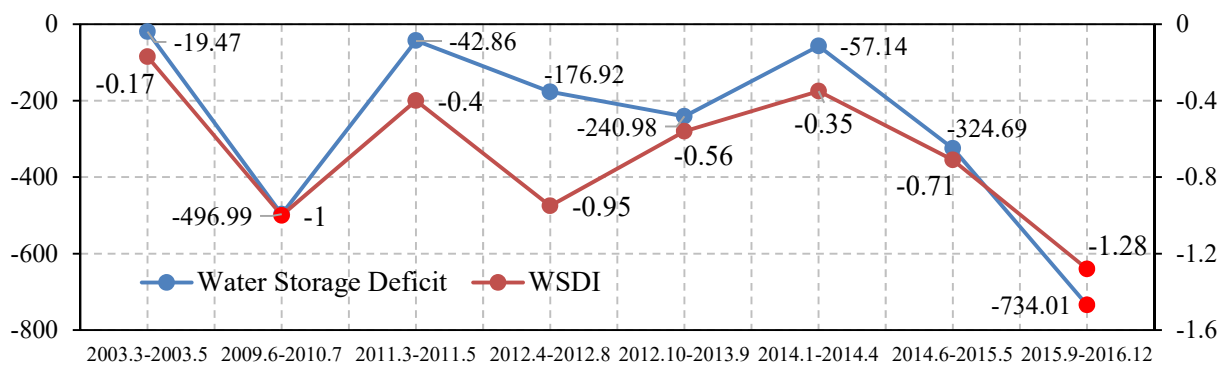


Figure. S5 Comparison of eight drought events identified by total WSD and WSDI during the study. The most severe droughts in 2010 and 2016 are shown with red shading indicate.