Supplementary Figures:

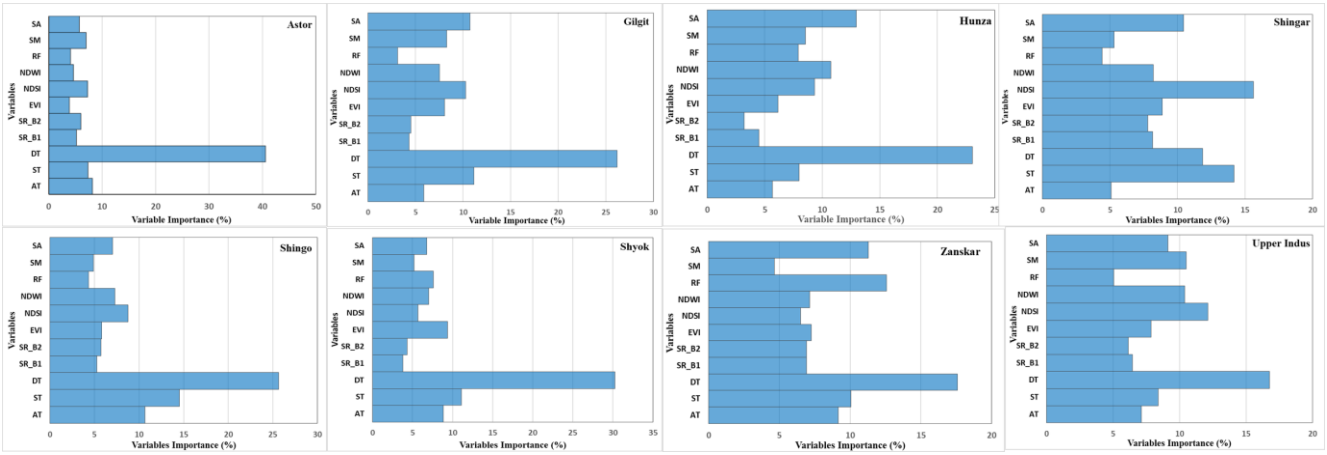

Fig.S1. Random Forest-Regression based variables importance for quantifying anomalous precipitation from July 1 to August 31, 2022 across Upper Indus catchment as well as along all the major tributaries:

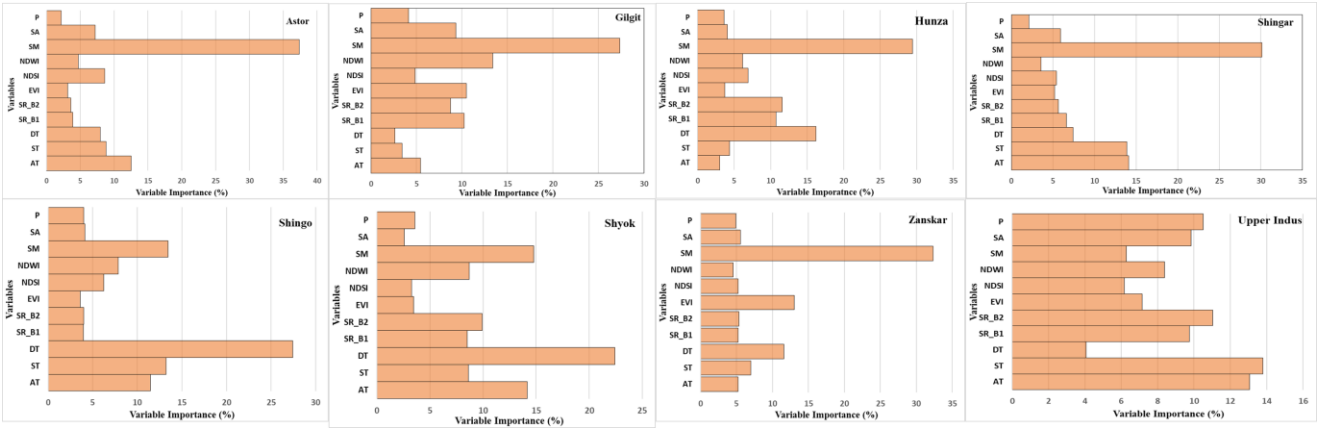

Fig.S2. Random Forest-Regression based variables importance for quantifying anomalous runoff from July 1 to August 31, 2022 across Upper Indus catchment as well as along all the major tributaries: