Supplementary material
Figure S1: Global maps with annual average reference potential evaporation (PET; m day$^{-1}$). On top annual average CRU Penman-Monteith reference PET. In the right column reference PET obtained with the Penman-Monteith (PM), the standard Hargreaves (HGorig) and Blaney-Criddle (BCorig) and in the right column reference PET obtained with Priestley-Taylor (PT), Hargreaves with increased multiplication factor (HGrecal) and the re-calibrated Blaney-Criddle equation (BCrecal) are displayed.
Figure S2a: Global maps with seasonal average daily actual evapotranspiration (m day$^{-1}$). From left to right Penman-Monteith (PM), Hargreaves with increased multiplication factor (HG recal) and re-calibrated Blaney-Criddle (BC recal) and from top to bottom the DJF, MAM, JJA and SON seasons.
Figure S2b: Global maps with seasonal average daily actual evapotranspiration (m day$^{-1}$). From left to right Priestley-Taylor (PT), the original Hargreaves equation (HGorig) and the original Blaney-Criddle equation (BCorig) and from top to bottom the DJF, MAM, JJA and SON seasons.
Figure S3a: Global maps with seasonal average daily cell specific runoff (m day$^{-1}$).

From left to right Penman-Monteith (PM), Hargreaves with increased multiplication factor (HGrecal) and re-calibrated Blaney-Criddle (BCrecal) and from top to bottom the DJF, MAM, JJA and SON seasons.
Figure S3b: Global maps with seasonal average daily cell specific runoff (m day$^{-1}$). From left to right Priestley-Taylor (PT), the original Hargreaves equation (HGorig) and the original Blaney-Criddle equation (BCorig) and from top to bottom the DJF, MAM, JJA and SON seasons.