

Table S1. Description of multi-source PPs used in this study.

Datasets (short name)	Spatial resolution	Temporal resolution	Period (used in this study)	Reference
APHRODITE V1101, V1801R1	0.25°	daily	1995-2013	(Yatagai <i>et al.</i> 2012) [49],
CHIRPS V2.0	0.25°	daily	1995-2013	(Funk <i>et al.</i> 2015) [50]
CPC-Global	0.5°	daily	1995-2013	(Xie <i>et al.</i> 2010) [51]
GPCC V.2018 (V2)	1°	daily	1995-2013	(Schamm <i>et al.</i> 2014) [52]
GPCP-1DD V1.2	1°	daily	October 1996-2013	(Huffman <i>et al.</i> 2001) [53]
PERSIANN	0.25°	daily	March 2000-2013	(Sorooshian <i>et al.</i> 2000) [54]
CHRS CCS	0.25°	daily	2003-2013	(Hong <i>et al.</i> 2004) [55]
CHRS CDR	0.25°	daily	2003-2013	(Ashouri <i>et al.</i> 2015) [56]

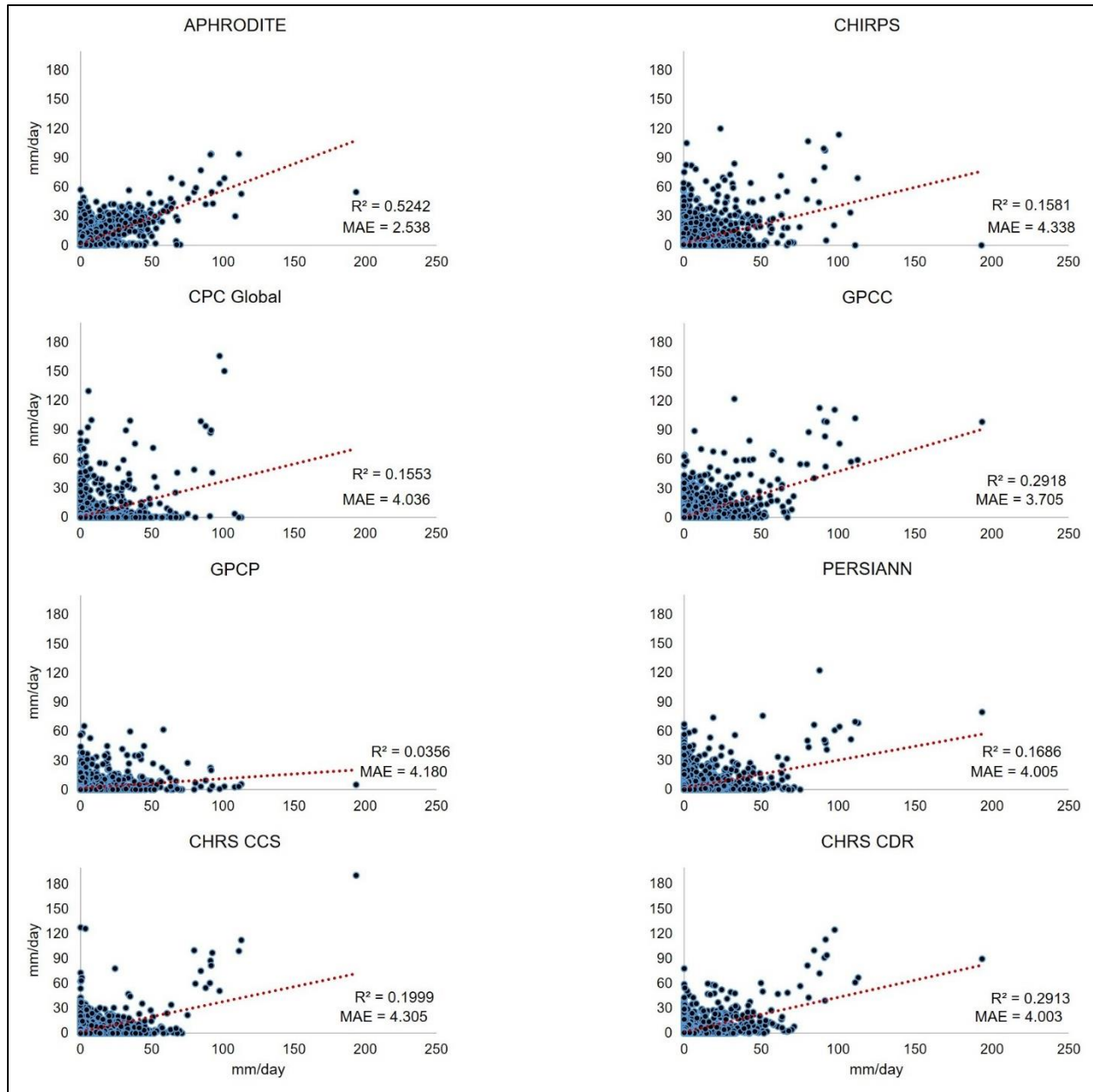


Figure S1. Performance of different PPs against gauged precipitation in simulating daily precipitation in Dhoke Pathan sub-catchment.

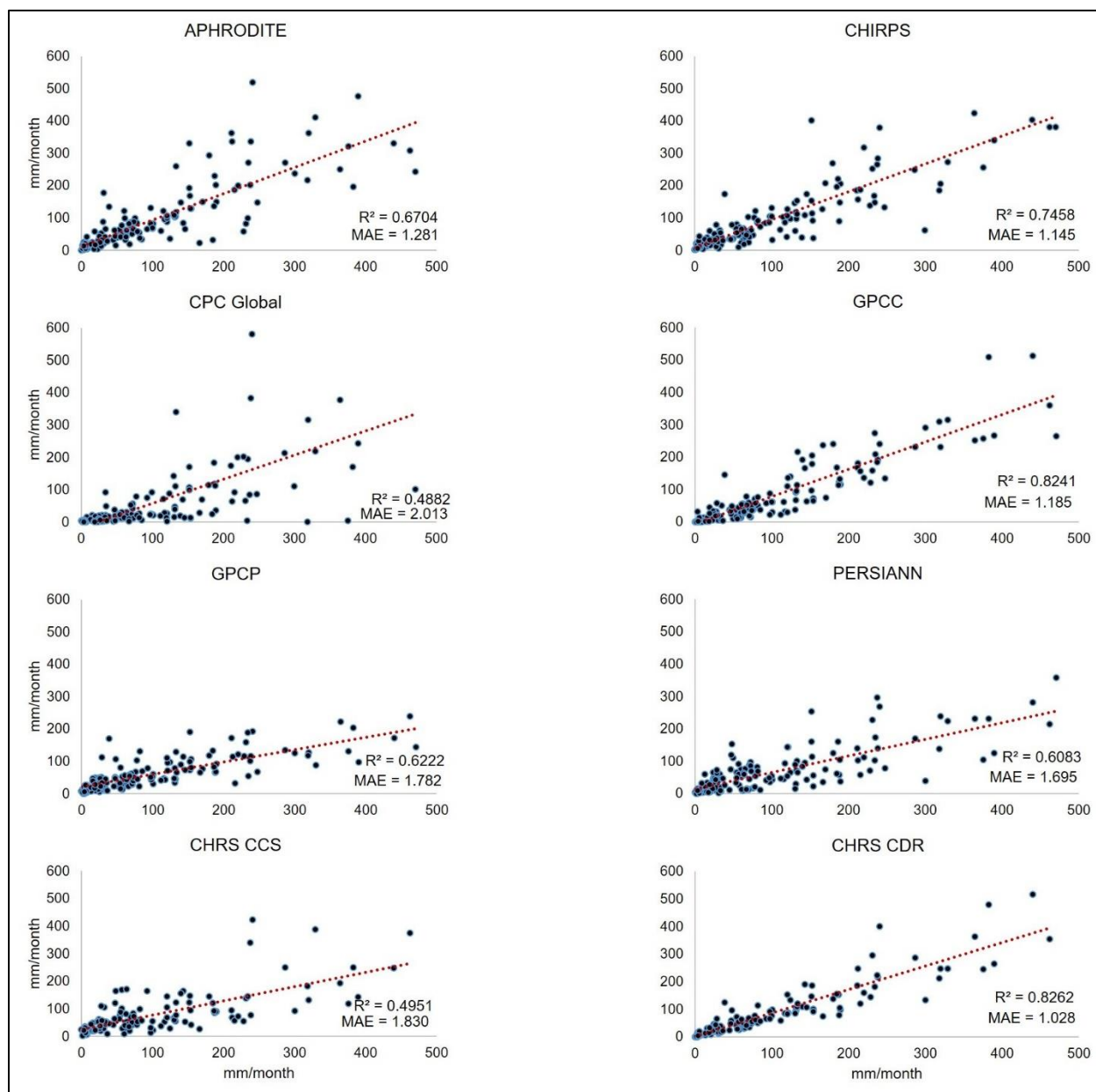


Figure S2. Performance of different PPs against gauged precipitation in simulating monthly precipitation in Dhoke Pathan sub-catchment.

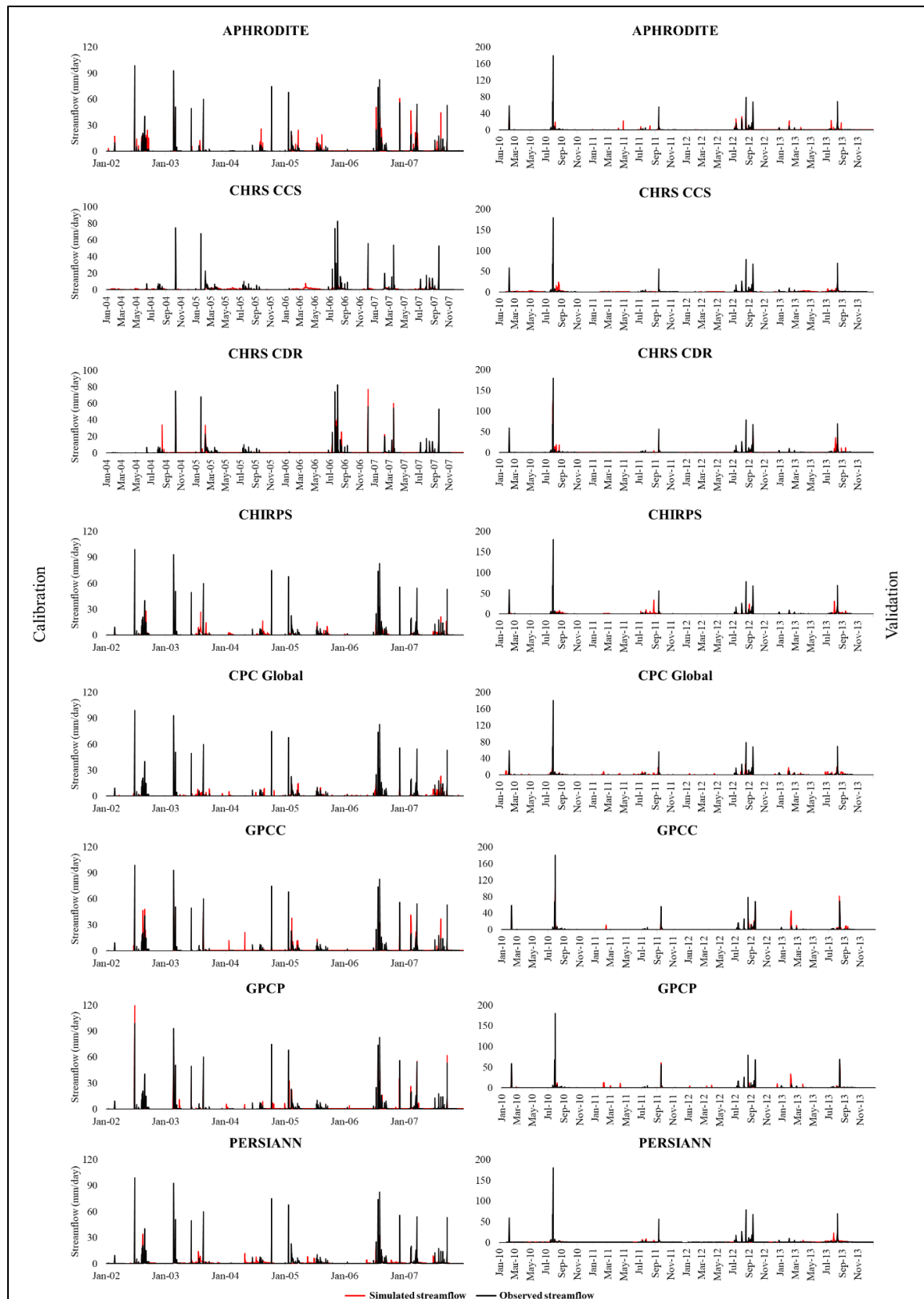


Figure S3. Daily streamflow during calibration and validations periods simulated by the HBV-light forced with the precipitation input from eight products in Chirah sub-catchment.

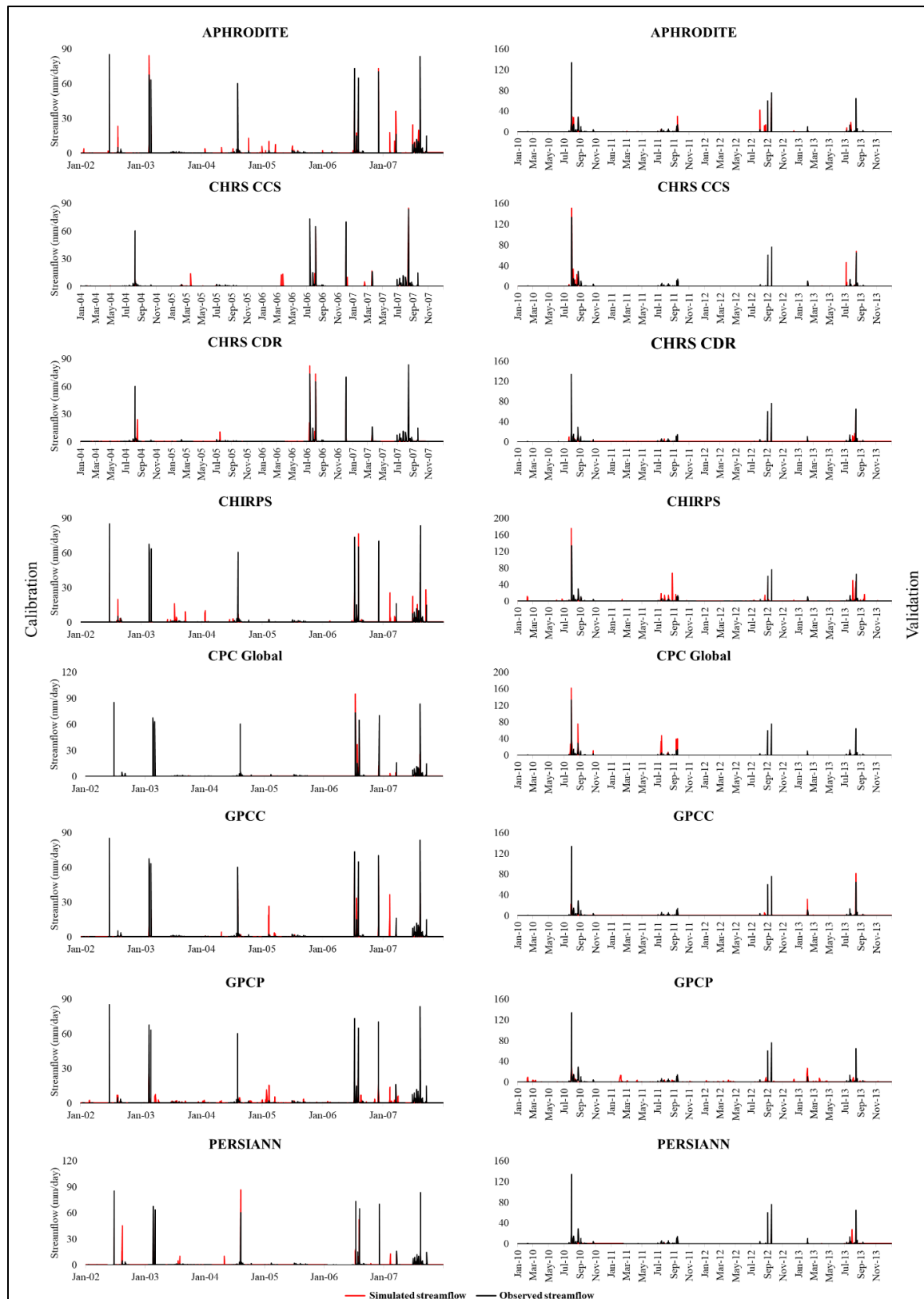


Figure S4. Daily streamflow during calibration and validations periods simulated by the HBV-light forced with the precipitation input from eight products in Dhoke Pathan sub-catchment.

Table S2. Parameter ranges for optimized performance of the HBV-light during calibration and validation periods with observed precipitation data.

Parameters	Ranges	Units
PERC	18–24	mm/day*
UZL	18–22	mm
K0	0.85– 0.98	1/day
K1	0.15–0.25	1/day
K2	0.00001–0.0001	1/day
MAXBAS	1–1.5	day
TT	-1–2	°C
CFMAX	0.5–4	mm/day °C
SP	0.3–0.65	-
SFCF	1–3	-
FC	4–12	mm
LP	0.6–0.9	-
BETA	6.5–8.5	-

* Day is a unit of time used in this study for model setup and development.