Table S1. SWAT model sensitive parameters of the Kaidu River Upper Basin

No.	Parameter Name	Range	Description	Initial Value	Fitted Value	Unit
1	v__ALPHA_BF.gw	0,1	Baseflow alpha factor	0.048	0.99	days
2	v__GW_DELAY.gw	0,500	Groundwater delay	31	454.63	days
3	r__SLSUBBSN.hru	−0.5,1	Average slope length	0	0.49	m
4	v__SOL_K().sol	0,2000	Saturated hydraulic conductivity	17	140.50	mm/hr
5	v__CN2.mgt	35,98	Initial SCS runoff curve number for moisture condition II	84	35.49	/
6	v__CH_K2.rte	−0.01,500	Effective hydraulic conductivity in main channels alluvium	0	181.87	mm/hr
7	v__LAT_TTIME.hru	0,180	Lateral flow travel time	0	9.59	days
8	v__SOL_AWC().sol	0,1	Available water capacity of the soil layer	0.19	0.94	mm/mm
9	r__SMFMX.bsn	−1,1	Maximum melt rate for during the year	4.5	-0.79	mm/C-days
10	r__TIMP.bsn	−1,0	Snow pack temperature lag factor	0	-0.19	/
11	v__RCHRG_DP.gw	0,1	Deep aquifer percolation fraction	0.05	0.99	fraction
12	v__SMFMN.bsn	−1,1	Minimum melt rate for during the year	0	0.05	mm/C-days
13	v__REVAPMN.gw	−1,0.3	Threshold depth of water in the shallow aquifer required for re-evaporation to occur	750	-0.71	mm
14	v__TLAPS.sub	−50,50	Temperature lapse rate	0	-1.61	C/km
15	v__OV_N.hru	0.01,30	Manning's n value for overland flow	0.05	7.57	/
16	v__GWQMN.gw	0,5000	Threshold depth of water in the shallow aquifer required for return flow to occur	1000	/	mm
17	v__CH_N2.rte	−0.01,0.3	Manning's n value for the main channels	0.014	/	/
18	v__SHALLST.gw	0,5000	Initial depth of water in the shallow aquifer	1000	/	mm
19	v__SMTMP.bsn	−5,5	Snow melt base temperature	0.5	/	C
20	v__GW_REVAP.gw	0.02,0.2	Groundwater re-evaporation coefficient	0.02	/	/
21	v__CH_K1.sub	0,300	Effective hydraulic conductivity in tributary channels alluvium	0	/	mm/hr
22	v__SFTMP.bsn	−5,5	Snowfall temperature	1	/	C
23	v__EPCO.bsn	0,1	Plant uptake compensation factor	0.5	/	/
24	v__SURLAG.bsn	1,24	Surface runoffs lag time	4	/	/
25	v__PLAPS.sub	−500,500	Precipitation lapse rate	0	/	mm/km
26	v__ESCO.bsn	0,1	Soil evaporation compensation factor	0.95	/	/
27	v__CH_N1.sub	0.01,30	Manning's n value for the tributary channels	0.014	/	/
28	v__SNOCOVMX.bsn	0,500	Minimum snow water content that corresponds to 100% snow cover	1	/	mm