



Supplement of

Growth in agricultural water demand aggravates water supply-demand risk in arid Northwest China: more a result of anthropogenic activities than climate change

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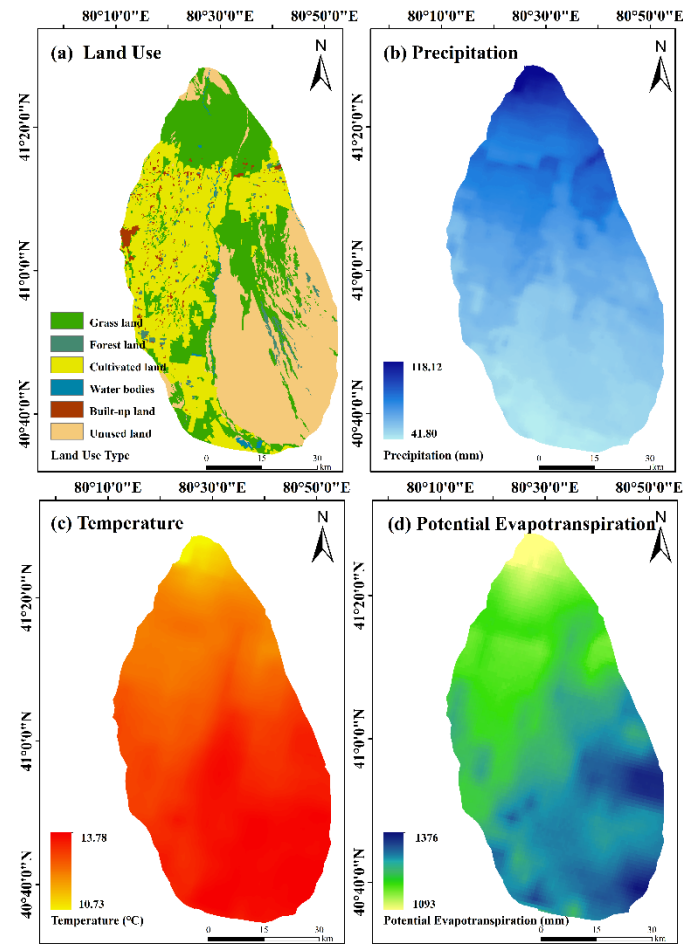


Fig. S1. Key variables in the Tailan River Basin: (a) Land use; (b) Precipitation; (c) Temperature; (d) Potential evapotranspiration.

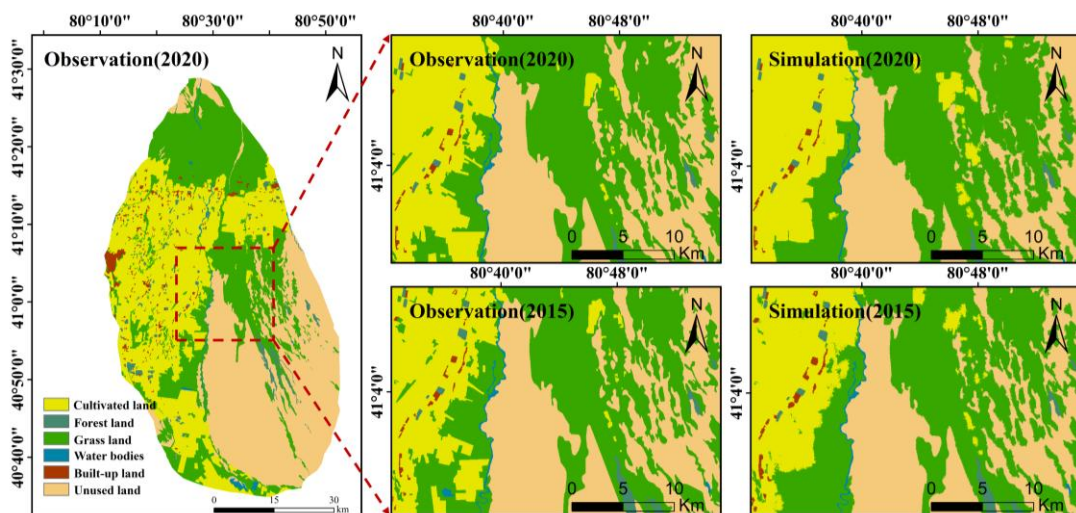


Fig. S2. Observed (2015/2020) and simulated land use maps of the Tailan River Basin (left/middle and right, respectively).

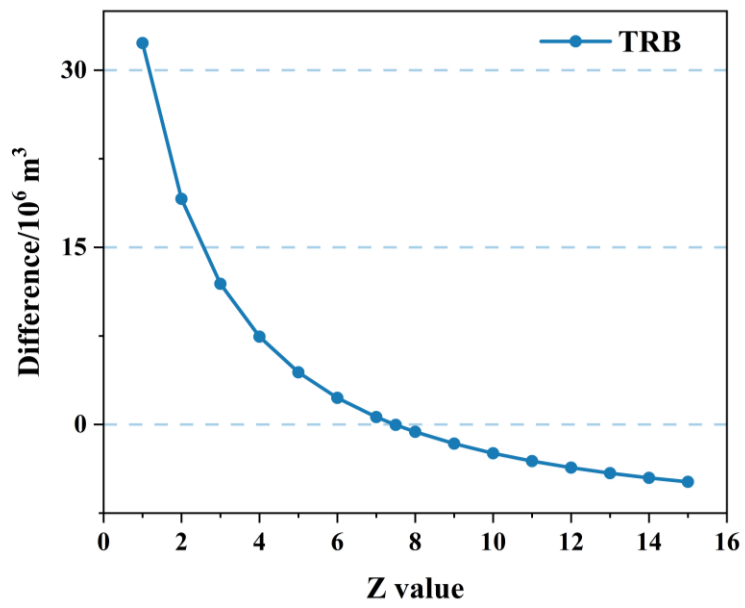


Fig. S3. Discrepancy between observed and simulated surface water resources volume in the Tailan River Basin under different Z values.

27 **Table S1.** Accuracy metrics of the PLUS model during different validation periods.

Simulation time	Number of factors	OA	Kappa	FOM
2015	7	0.91	0.86	0.17
	13	0.92	0.88	0.18
	19	0.91	0.87	0.18
2020	7	0.88	0.83	0.19
	13	0.90	0.85	0.25
	19	0.85	0.85	0.24

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31 **Table S2.** Dynamics of Water Supply and Demand in the Tailan River Basin Under 24 Land-Climate

32 Combination Scenarios (2020–2050)

Year	Water yield supply(×10 ⁵ m ³)						Year	Water yield demand(×10 ⁵ m ³)						
	NIS	FSS	EDS	WPS	EPS	BES		NIS	FSS	EDS	WPS	EPS	BES	
2020	64.68						2020	158.98						
LAND	2030	64.78	64.92	64.60	64.53	64.99	64.93	2030	1887	1993	1879	1575	1899	1892
	2040	64.94	65.17	64.83	64.79	65.32	65.05	2040	3448	3535	3440	3188	3461	3453
	2050	65.70	65.59	65.59	65.67	65.46	65.69	2050	4865	4935	4850	4646	4878	4870
S119	2030	64.06	64.25	63.76	63.69	64.47	64.35	2030	2089	2198	2081	1769	2101	2094
	2040	32.49	32.64	32.41	32.37	32.75	32.58	2040	3667	3756	3659	3400	3680	3673
	2050	25.33	25.29	25.26	25.31	25.23	25.33	2050	5060	5132	5046	4837	5074	5066
S245	2030	51.05	51.19	50.80	50.76	51.37	51.27	2030	1997	2104	1989	1680	2009	2002
	2040	89.33	89.68	89.12	88.97	89.93	89.55	2040	3554	3642	3546	3291	3567	3560
	2050	162.2	162.8	162.6	162.5	162.3	162.7	2050	5269	5342	5254	5040	5283	5274
S585	2030	138.0	138.3	137.6	137.4	138.7	138.5	2030	2032	2141	2024	1715	2044	2038
	2040	133.5	133.9	133.1	133	134.3	133.8	2040	3749	3839	3740	3479	3762	3754
	2050	61.82	61.79	61.71	61.78	61.62	61.81	2050	5316	5390	5301	5086	5330	5321

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36 **Table S3.** Results of analysis of variance for water supply and demand

Factors	Water Supply	Water Demand
Land use scenario	ns	***
Climate change scenario	***	**
Land use scenario × Climate change scenario	ns	ns

37 Note: * indicates significant difference at $P < 0.05$; ** indicates significant difference at $P < 0.01$
38 level; *** indicates significant differences at $P < 0.001$ level; ns indicates no significant difference
39 at $P < 0.05$ level.