



Supplement of

Impacts of inter-basin water diversion projects on the feedback loops of water supply–hydropower generation–environment conservation nexus

Jiaoyang Wang et al.

Correspondence to: Dedi Liu (dediliu@whu.edu.cn)

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The values of LRR_n (i.e., LRR_1 , LRR_2 , LRR_3 for log response ratio of the S, H, and E component) for five reservoirs when there was no IWDPs and different priority orders was set at the annual scale are shown in Table S1, and values when there was IWDPs and different priority orders was set are shown in Table S2. If there was no IWDPs and S-Priority was set, values of LRR_2 for HJX, AK, WFZ reservoirs are negative during 2006-2020. There are two positive values of LRR_2 for DJK in 2010, 2018, and one positive values for XL in 2020. And there is abundant water in all these three years. The minimum values of LRR_2 for five reservoirs are both found in the driest year. And there are more small values in AK and WFZ. The mean values of LRR_3 for five reservoirs are -0.02, -0.03, -0.03, -0.06, and -0.06. The small values of LRR_3 for five reservoirs are found in dry years or high ecological flow requirement years such as 2010, 2011 and 2017. Downstream reservoirs can bring stronger negative feedbacks of S on E, so WFZ and XL have more small values of LRR_3 . If there was no IWDPs but H-Priority was still set, the zero values of LRR_1 for AK and WFZ are found in all years, and WFZ gets more negative values of LRR_1 . The positive values of LRR_3 for five reservoirs are found in abundant water years, while negative values of LRR_2 for DJK and its upstream reservoirs are found because of the increased water storage from DJK in these years. If there was no IWDPs but E-Priority was still set, negative values of LRR_1 for HJX, DJK and XL and the positive values of LRR_2 can be found in dry years and high ecological flow requirement years. The negative values of LRR_2 are mainly found in abundant water years. Negative and positive values of LRR_n for HJX, AK, DJK, WFZ, and values of LRR_1 , LRR_2 for XL turn to be more extreme than those without IWDPs. The values of LRR_3 for XL are closer to zero if there were IWDPs.

Table S1. LRR_t values when there are no IWDPs and different priority orders are set at the annual scale.

The Log Response Ratio		Reservoirs	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
If there was no IWDPs and S-Priority was set	LRR_2	HJX	-0.08	-0.07	-0.08	-0.07	-0.05	-0.04	-0.05	-0.06	-0.06	-0.06	-0.08	-0.06	-0.06	-0.05	-0.05
		AK	-0.09	-0.08	-0.10	-0.08	-0.06	-0.05	-0.05	-0.07	-0.07	-0.08	-0.11	-0.07	-0.08	-0.07	-0.07
		DJK	-0.05	-0.05	-0.06	-0.06	0.00	-0.03	-0.04	-0.06	-0.06	-0.06	-0.06	-0.01	0.00	-0.06	-0.06
		WFZ	-0.07	-0.06	-0.08	-0.08	-0.05	-0.07	-0.06	-0.08	-0.08	-0.08	-0.08	-0.05	-0.05	-0.07	-0.07
		XL	-0.18	-0.02	-0.02	-0.02	-0.02	-0.06	-0.02	-0.05	-0.02	-0.05	-0.02	-0.02	-0.02	-0.02	0.06
	LRR_3	HJX	0.00	0.00	0.00	0.00	-0.05	0.00	0.00	-0.06	0.00	0.00	0.00	-0.09	0.00	-0.05	-0.05
		AK	0.00	0.00	0.00	0.00	-0.05	0.00	0.00	-0.10	0.00	0.00	0.00	-0.11	0.00	-0.06	-0.06
		DJK	0.00	0.00	0.00	0.00	-0.09	-0.24	0.00	0.00	0.00	0.00	0.00	-0.13	-0.06	0.00	0.00
		WFZ	0.00	0.00	0.00	0.00	-0.14	-0.43	0.00	0.00	0.00	0.00	0.00	-0.19	-0.12	0.00	0.00
		XL	0.00	0.00	0.00	0.00	-0.14	-0.43	-0.06	0.00	0.00	0.00	0.00	-0.17	0.00	0.00	-0.12
If there was no IWDPs and H-Priority was set	LRR_1	HJX	-23.25	-23.26	-23.29	-23.30	-23.26	-23.27	-23.29	-23.29	-23.28	-23.29	-23.29	-23.31	-23.31	-23.28	-23.26
		AK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		DJK	-23.04	-23.05	-23.18	-23.13	-0.67	-1.89	0.00	-23.00	-23.09	-23.14	-23.05	-1.07	0.00	-23.03	-23.01
		WFZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		XL	-24.63	0.00	0.00	0.00	0.00	-0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LRR_3	HJX	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.13	0.00	0.00	0.00	0.20	0.00	0.08	0.08
		AK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00
		DJK	0.00	0.00	0.00	0.00	-0.31	-0.10	0.00	0.00	0.00	0.00	0.00	-0.29	0.05	0.00	0.00
		WFZ	0.00	0.00	0.00	0.00	-0.28	-0.14	0.00	0.00	0.00	0.00	0.00	-0.23	0.05	0.00	0.00

		XL	0.00	0.00	0.00	0.00	-0.19	0.05	0.00	0.00	0.00	0.00	0.00	-0.15	0.00	0.00	0.18
		HJX	0.00	0.00	0.00	0.00	-0.44	0.00	-23.29	-23.29	-23.28	0.00	0.00	-23.31	-23.31	-23.28	-0.39
		AK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
If there	LRR_1	DJK	-23.04	-23.05	-23.18	-23.13	0.00	0.00	0.00	-23.00	-23.09	-23.14	-23.05	0.00	0.00	-23.03	-23.01
was no		WFZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IWDPs		XL	0.00	0.00	0.00	0.00	-24.44	-0.25	0.00	0.00	0.00	0.00	0.00	-24.42	0.00	0.00	-24.43
and E-		HJX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Priority		AK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
was set	LRR_2	DJK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		WFZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.03	0.00	0.00	0.02	0.02
		XL	0.08	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table S2. LRR_n values when there are IWDPs and different priority orders are set at the annual scale.

	The Log Response Ratio	Reser voirs	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
If there		HJX	-0.18	-0.18	-0.19	-0.18	-0.20	-0.28	-0.24	-0.20	-0.19	-0.19	-0.19	-0.20	-0.19	-0.21	-0.21
was		AK	-0.11	-0.09	-0.12	-0.10	-0.07	-0.05	-0.06	-0.08	-0.08	-0.09	-0.13	-0.08	-0.10	-0.08	-0.08
IWDPs	LRR_2	DJK	-0.07	-0.07	-0.17	-0.18	-0.05	-0.08	-0.06	-0.08	-0.08	-0.08	-0.08	-0.05	-0.05	-0.08	-0.08
and S-		WFZ	-0.10	-0.09	-0.18	-0.19	-0.06	-0.09	-0.08	-0.11	-0.10	-0.11	-0.10	-0.07	-0.06	-0.11	-0.10
Priority		XL	-0.29	-0.02	-0.02	-0.04	-0.02	-0.18	-0.12	-0.15	-0.06	-0.16	-0.05	-0.02	-0.11	-0.12	-0.02
was set	LRR_3	HJX	-0.07	-0.26	-0.24	-0.52	-0.27	0.00	-0.05	-0.26	0.00	-0.10	-0.28	-0.11	-0.11	-0.27	-0.26
		AK	0.00	0.00	0.00	0.00	-0.10	0.00	0.00	-0.15	0.00	0.00	-1.40	-0.22	0.00	-0.12	-0.12

		DJK	-0.12	-0.09	0.00	0.00	-0.10	-0.19	0.00	0.00	0.00	0.00	0.00	-0.12	-0.30	0.00	-0.14
		WFZ	-0.17	-0.03	0.00	0.00	-0.28	-0.27	0.00	0.00	0.00	0.00	0.00	-0.17	-0.42	0.00	-0.08
		XL	0.00	0.00	0.00	0.00	-0.28	0.00	0.00	0.00	0.00	0.00	0.00	-0.05	0.00	0.00	-0.03
		HJX	-23.25	-23.26	-23.29	-23.30	-23.26	-23.27	-23.29	-23.29	-23.28	-23.29	-23.29	-23.31	-23.31	-23.28	-23.26
		AK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
If there was IWDPs and H- Priority was set	LRR ₁	DJK	-23.04	-23.05	-23.18	-23.13	-0.67	-1.89	0.00	-23.00	-23.09	-23.14	-23.05	-1.07	0.00	-23.03	-23.01
		WFZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		XL	-24.63	0.00	0.00	0.00	0.00	-0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		HJX	0.00	0.34	0.00	0.71	0.59	0.00	0.03	0.78	0.00	0.01	0.01	0.97	0.04	0.58	0.56
		AK	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.12	0.00	0.00	0.00	0.13	0.00	0.10	0.10
	LRR ₃	DJK	0.06	0.00	0.00	0.00	-0.18	0.06	0.00	0.00	0.00	0.00	0.00	-0.07	0.33	0.00	0.06
		WFZ	0.00	0.00	0.00	0.00	-0.29	0.05	0.00	0.00	0.00	0.00	0.00	-0.06	0.30	0.00	0.00
		XL	0.00	0.00	0.00	0.00	-0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.32
		HJX	0.00	0.00	0.00	0.00	-0.44	0.00	-23.29	-23.29	-23.28	0.00	0.00	-23.31	-23.31	-23.28	-0.39
		AK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
If there was IWDPs and E- Priority was set	LRR ₁	DJK	-23.04	-23.05	-23.18	-23.13	0.00	0.00	0.00	-23.00	-23.09	-23.14	-23.05	0.00	0.00	-23.03	-23.01
		WFZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		XL	0.00	0.00	0.00	0.00	-24.44	-0.25	0.00	0.00	0.00	0.00	0.00	-24.42	0.00	0.00	-24.43
		HJX	-0.01	0.16	-0.01	0.24	0.20	0.01	0.16	0.21	0.22	0.00	-0.01	0.22	0.26	0.20	0.20
		AK	0.00	0.06	0.00	0.09	0.08	0.00	0.06	0.08	0.09	0.00	0.00	0.09	0.10	0.08	0.08
	LRR ₂	DJK	0.06	0.09	0.00	0.07	0.06	0.17	0.10	0.09	0.10	0.10	0.09	0.09	0.07	0.12	0.12
		WFZ	0.05	0.07	0.00	0.06	0.05	0.14	0.09	0.08	0.08	0.08	0.08	0.07	0.05	0.10	0.10
		XL	0.04	-0.02	-0.02	-0.02	-0.40	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.40	-0.02	-0.02	-0.40
		HJX	-0.01	0.16	-0.01	0.24	0.20	0.01	0.16	0.21	0.22	0.00	-0.01	0.22	0.26	0.20	0.20
		AK	0.00	0.06	0.00	0.09	0.08	0.00	0.06	0.08	0.09	0.00	0.00	0.09	0.10	0.08	0.08
		DJK	0.06	0.09	0.00	0.07	0.06	0.17	0.10	0.09	0.10	0.10	0.09	0.09	0.07	0.12	0.12

The values of LRR_n for five reservoirs when there was only water donation and different priority orders was set at the annual scale are shown in Table S3. If there was only water donation and S-Priority was set, values of LRR_2 and LRR_3 are lower than those without IWDPs. The values of LRR_2 and LRR_3 for HJX, DJK and XL decrease significantly, and these three reservoirs are severely impacted by water donation. If there was only water receiving and S-Priority was set, values of LRR_2 and LRR_3 for DJK, WFZ and XL show a slight increase. If there were both water donation and receiving and S-Priority was set, only XL has greater values of LRR_2 and LRR_3 than those without IWDPs.

If there was only water donation and H-Priority was set, HJX, DJK and XL have more negative values of LRR_1 as shown in Table S4, and all of these values are lower than those without IWDPs. DJK, WFZ and XL has more smaller values of LRR_3 than those without IWDPs. Smaller values of LRR_1 and LRR_3 for reservoirs are found in low flow years. If there was only water receiving and H-Priority was set, values of LRR_1 and LRR_3 for DJK, WFZ and XL increase only in low flow years. If there were both water donation and receiving and H-Priority was set, values of LRR_3 for XL are greater than those without IWDPs, while all other values of LRR_1 and LRR_3 are lower than those without IWDPs.

If there was only water donation and E-Priority was set, more negative values of LRR_1 for HJX, DJK and XL are found in low flow years as shown Table S5 and all of these values are lower than those without IWDPs as shown in Table S1. All five reservoirs get more smaller values of LRR_2 and only value of LRR_2 for XL in 2007 and 2008 increase because of the reduced spilled water with water donation. If there was only water receiving and E-Priority was set, there are no change on values of LRR_1 for five reservoirs, so water receiving has minimal impact on feedbacks of E on S. values of LRR_2 for DJK, WFZ and XL are greater than those without IWDPs. If there were both water donation and receiving and H-Priority was set, values of LRR_1 for HJX, DJK and XL are found to be similar to those with only water donation. Values of LRR_2 for DJK and WFZ are greater than those with only water receiving.

Therefore, water donation has negative impacts on the negative feedbacks between S and H, on the negative feedbacks between S and E, and on the positive feedbacks between H and E, while receiving water has positive impacts on these feedbacks across different time scales. Compared with the values of LRR_n at monthly scale, the values of LRR_n at seasonal and annual scales are stable and changes can be found in low flow periods.

Table S3. LRR_t values when there are only water donation and different priority orders are set at the annual scale.

The Log Response Ratio		Reservoirs	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
If there was only water donation and S-Priority was set	LRR_2	HJX	-0.61	-0.52	-0.63	-0.55	-0.44	-0.43	-0.43	-0.45	-0.46	-0.48	-0.64	-0.46	-0.49	-0.44	-0.44
		AK	-0.26	-0.22	-0.28	-0.23	-0.16	-0.12	-0.13	-0.18	-0.19	-0.21	-0.29	-0.19	-0.21	-0.17	-0.17
		DJK	-0.42	-0.46	-0.52	-0.53	-0.18	-0.32	-0.38	-0.40	-0.41	-0.41	-0.40	-0.26	-0.13	-0.48	-0.48
		WFZ	-0.40	-0.42	-0.49	-0.50	-0.26	-0.33	-0.36	-0.39	-0.39	-0.40	-0.38	-0.27	-0.26	-0.45	-0.43
		XL	-0.37	-0.02	-0.02	-0.05	-0.03	-0.20	-0.14	-0.16	-0.07	-0.17	-0.06	-0.02	-0.13	-0.13	0.06
	LRR_3	HJX	-0.07	-0.60	-0.24	-1.23	-0.92	0.00	-0.08	-1.10	0.00	-0.11	-0.29	-1.17	-0.15	-0.92	-0.88
		AK	0.00	0.00	0.00	0.00	-0.21	0.00	0.00	-0.30	0.00	0.00	-1.40	-0.38	0.00	-0.23	-0.22
		DJK	-0.18	-0.14	0.00	0.00	-1.10	-1.21	0.00	0.00	0.00	0.00	0.00	-1.09	-1.06	0.00	-0.20
		WFZ	-0.24	-0.14	0.00	0.00	-1.12	-1.28	0.00	0.00	0.00	0.00	0.00	-1.12	-1.11	0.00	-0.14
		XL	-1.74	0.00	0.00	-0.41	-0.64	-1.61	-1.44	0.00	0.00	0.00	0.00	-0.58	0.00	0.00	-0.58
If there was only water donation and H-Priority	LRR_1	HJX	-23.25	-23.26	-23.29	-23.30	-23.26	-23.27	-23.29	-23.29	-23.28	-23.29	-23.29	-23.31	-23.31	-23.28	-23.26
		AK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		DJK	-23.04	-23.05	-23.18	-23.13	-23.22	-24.43	-23.20	-23.00	-23.09	-23.14	-23.05	-23.04	-23.05	-23.03	-23.01
		WFZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		XL	-24.63	0.00	0.00	0.00	-0.49	-24.47	-2.02	-1.07	0.00	-1.07	0.00	0.00	-1.66	0.00	0.00
	LRR_3	HJX	0.00	0.00	0.00	0.00	-0.07	0.00	0.00	-0.06	0.00	0.00	0.00	-0.09	0.00	-0.06	-0.07
		AK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	0.00	0.00	0.00	-0.03	0.00	0.00	0.00
		DJK	0.00	0.00	0.00	0.00	-1.18	-0.96	0.00	0.00	0.00	0.00	0.00	-1.04	-0.39	0.00	0.00

was set		WFZ	0.00	0.00	0.00	0.00	-1.14	-0.93	0.00	0.00	0.00	0.00	0.00	-1.01	-0.42	0.00	0.00
		XL	0.00	0.00	0.00	0.00	-0.47	-0.31	-0.03	0.00	0.00	0.00	0.00	-0.44	0.00	0.00	-0.13
If there was only water donatio n and E- Priority was set	LRR_1	HJX	0.00	-0.80	0.00	-1.47	-23.26	0.00	-23.29	-23.29	-23.28	-0.02	-0.01	-23.31	-23.31	-23.28	-23.26
		AK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		DJK	-23.04	-23.05	-23.18	-23.13	-23.22	-24.43	-23.20	-23.00	-23.09	-23.14	-23.05	-23.04	-23.05	-23.03	-23.01
		WFZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		XL	-0.90	0.00	0.00	0.00	-24.44	-3.44	-3.81	0.00	0.00	0.00	0.00	-24.42	0.00	0.00	-24.43
	LRR_2	HJX	-0.44	-0.18	-0.46	-0.12	-0.04	-0.15	-0.02	-0.04	-0.04	-0.29	-0.46	-0.04	-0.04	-0.04	-0.04
		AK	-0.16	-0.07	-0.16	-0.05	-0.02	-0.07	-0.01	-0.02	-0.02	-0.11	-0.16	-0.02	-0.02	-0.02	-0.02
		DJK	-0.29	-0.30	-0.34	-0.28	-0.07	-0.07	-0.22	-0.23	-0.23	-0.23	-0.23	-0.12	0.00	-0.27	-0.27
		WFZ	-0.25	-0.25	-0.29	-0.24	-0.14	-0.08	-0.19	-0.20	-0.20	-0.20	-0.19	-0.13	-0.13	-0.23	-0.22
		XL	-0.02	-0.02	-0.02	-0.02	-0.40	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.40	-0.02	-0.02	-0.32

Table S4. LRR_n values when there are only water receiving and different priority orders are set at the annual scale.

	The Log Response Ratio	Reser voirs	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
If there was only water receivi	LRR_2	HJX	-0.08	-0.07	-0.08	-0.07	-0.05	-0.04	-0.05	-0.06	-0.06	-0.06	-0.08	-0.06	-0.06	-0.05	-0.05
		AK	-0.09	-0.08	-0.10	-0.08	-0.06	-0.05	-0.05	-0.07	-0.07	-0.08	-0.11	-0.07	-0.08	-0.07	-0.07
		DJK	-0.04	-0.03	-0.04	-0.06	0.00	-0.03	-0.02	-0.05	-0.05	-0.05	-0.05	0.00	0.01	-0.05	-0.05
		WFZ	-0.04	-0.02	-0.03	-0.05	-0.03	-0.05	-0.03	-0.05	-0.05	-0.05	-0.05	-0.04	-0.02	-0.05	-0.05
		XL	-0.16	-0.02	-0.02	-0.02	-0.02	-0.05	-0.02	-0.04	-0.02	-0.05	-0.02	-0.02	-0.02	-0.02	0.06

ng and S- Priority was set	LRR_3	HJX	0.00	0.00	0.00	0.00	-0.05	0.00	0.00	-0.06	0.00	0.00	0.00	-0.09	0.00	-0.05	-0.05
		AK	0.00	0.00	0.00	0.00	-0.05	0.00	0.00	-0.10	0.00	0.00	0.00	-0.11	0.00	-0.06	-0.06
		DJK	0.00	0.00	0.00	0.00	-0.09	-0.24	0.00	0.00	0.00	0.00	0.00	-0.13	-0.04	0.00	0.00
		WFZ	0.00	0.00	0.00	0.00	-0.09	-0.31	0.00	0.00	0.00	0.00	0.00	-0.12	-0.04	0.00	0.00
		XL	0.00	0.00	0.00	0.00	0.55	0.08	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.45
If there was only water receivi	LRR_1	HJX	-23.25	-23.26	-23.29	-23.30	-23.26	-23.27	-23.29	-23.29	-23.28	-23.29	-23.29	-23.31	-23.31	-23.28	-23.26
		AK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		DJK	-23.04	-23.05	-23.18	-23.13	0.00	-1.06	0.00	-23.00	-23.09	-23.14	-23.05	-1.07	0.00	-23.03	-23.01
		WFZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		XL	-24.63	0.00	0.00	0.00	0.00	-0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ng and H- Priority was set	LRR_3	HJX	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.13	0.00	0.00	0.00	0.20	0.00	0.08	0.08
		AK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00
		DJK	0.00	0.00	0.00	0.00	-0.27	-0.07	0.00	0.00	0.00	0.00	0.00	-0.11	0.07	0.00	0.00
		WFZ	0.00	0.00	0.00	0.00	-0.20	-0.02	0.00	0.00	0.00	0.00	0.00	-0.04	0.09	0.00	0.00
		XL	0.00	0.00	0.00	0.00	-0.14	0.05	0.00	0.00	0.00	0.00	0.00	-0.03	0.00	0.00	0.25
If there was only water receivi	LRR_1	HJX	0.00	0.00	0.00	0.00	-0.44	0.00	-23.29	-23.29	-23.28	0.00	0.00	-23.31	-23.31	-23.28	-0.39
		AK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		DJK	-23.04	-23.05	-23.18	-23.13	0.00	0.00	0.00	-23.00	-23.09	-23.14	-23.05	0.00	0.00	-23.03	-23.01
		WFZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		XL	0.00	0.00	0.00	0.00	-24.44	-0.08	0.00	0.00	0.00	0.00	0.00	-24.42	0.00	0.00	-24.43
ng and E- Priority	LRR_2	HJX	-0.08	-0.07	-0.08	-0.07	-0.05	-0.04	-0.05	-0.06	-0.06	-0.06	-0.08	-0.06	-0.06	-0.05	-0.05
		AK	-0.09	-0.08	-0.10	-0.08	-0.06	-0.05	-0.05	-0.07	-0.07	-0.08	-0.11	-0.07	-0.08	-0.07	-0.07
		DJK	-0.05	-0.05	-0.06	-0.06	0.00	-0.03	-0.04	-0.06	-0.06	-0.06	-0.06	-0.01	0.00	-0.06	-0.06

was set	WFZ	-0.07	-0.06	-0.08	-0.08	-0.05	-0.07	-0.06	-0.08	-0.08	-0.08	-0.08	-0.05	-0.05	-0.07	-0.07
	XL	-0.18	-0.02	-0.02	-0.02	-0.02	-0.06	-0.02	-0.05	-0.02	-0.05	-0.02	-0.02	-0.02	-0.02	0.06

Table S5. LRR_n values when there are both water donation and receiving and different priority orders are set at the annual scale.

The Log Response Ratio		Reservoirs	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
If there are both water donation and receiving and S-Priority was set	LRR_2	HJX	-0.61	-0.52	-0.63	-0.55	-0.44	-0.43	-0.43	-0.45	-0.46	-0.48	-0.64	-0.46	-0.49	-0.44	-0.44
		AK	-0.26	-0.22	-0.28	-0.23	-0.16	-0.12	-0.13	-0.18	-0.19	-0.21	-0.29	-0.19	-0.21	-0.17	-0.17
		DJK	-0.41	-0.43	-0.48	-0.53	-0.18	-0.32	-0.36	-0.40	-0.40	-0.40	-0.40	-0.25	-0.10	-0.47	-0.47
		WFZ	-0.37	-0.36	-0.41	-0.45	-0.24	-0.30	-0.32	-0.36	-0.35	-0.36	-0.35	-0.25	-0.23	-0.41	-0.39
		XL	-0.35	-0.02	-0.02	-0.04	-0.02	-0.18	-0.12	-0.15	-0.06	-0.16	-0.05	-0.02	-0.11	-0.12	0.06
	LRR_3	HJX	-0.07	-0.60	-0.24	-1.23	-0.92	0.00	-0.08	-1.10	0.00	-0.11	-0.29	-1.17	-0.15	-0.92	-0.88
		AK	0.00	0.00	0.00	0.00	-0.21	0.00	0.00	-0.30	0.00	0.00	-1.40	-0.38	0.00	-0.23	-0.22
		DJK	-0.18	-0.09	0.00	0.00	-1.10	-1.21	0.00	0.00	0.00	0.00	0.00	-1.09	-0.99	0.00	-0.20
		WFZ	-0.17	-0.03	0.00	0.00	-1.07	-1.20	0.00	0.00	0.00	0.00	0.00	-1.07	-1.03	0.00	-0.08
		XL	0.00	0.00	0.00	0.00	0.19	0.08	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.09
If there are both	LRR_1	HJX	-23.25	-23.26	-23.29	-23.30	-23.26	-23.27	-23.29	-23.29	-23.28	-23.29	-23.29	-23.31	-23.31	-23.28	-23.26
		AK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		DJK	-23.04	-23.05	-23.18	-23.13	-23.22	-24.43	-23.20	-23.00	-23.09	-23.14	-23.05	-23.04	-1.24	-23.03	-23.01

water donatio n and receivi ng and H- Priority was set		WFZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		XL	-24.63	0.00	0.00	0.00	-0.27	-24.47	-0.94	-0.70	0.00	-0.72	0.00	0.00	-0.95	0.00
	LRR_3	HJX	0.00	0.00	0.00	0.00	-0.07	0.00	0.00	-0.06	0.00	0.00	0.00	-0.09	0.00	-0.06
		AK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	0.00	0.00	0.00	-0.03	0.00	0.00
		DJK	0.00	0.00	0.00	0.00	-1.18	-0.96	0.00	0.00	0.00	0.00	0.00	-1.04	-0.36	0.00
		WFZ	0.00	0.00	0.00	0.00	-1.09	-0.88	0.00	0.00	0.00	0.00	0.00	-0.96	-0.31	0.00
		XL	0.00	0.00	0.00	0.00	0.28	0.08	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.45
If there are both water donatio n and receivi ng and E- Priority was set	LRR_1	HJX	0.00	-0.80	0.00	-1.47	-23.26	0.00	-23.29	-23.29	-23.28	-0.02	-0.01	-23.31	-23.31	-23.28
		AK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		DJK	-23.04	-23.05	-23.18	-23.13	-23.22	-24.43	-23.20	-23.00	-23.09	-23.14	-23.05	-23.04	-1.24	-23.03
		WFZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		XL	-0.63	0.00	0.00	0.00	-24.44	-1.74	-1.27	0.00	0.00	0.00	0.00	-24.42	0.00	-24.43
	LRR_2	HJX	-0.44	-0.18	-0.46	-0.12	-0.04	-0.15	-0.02	-0.04	-0.04	-0.29	-0.46	-0.04	-0.04	-0.04
		AK	-0.16	-0.07	-0.16	-0.05	-0.02	-0.07	-0.01	-0.02	-0.02	-0.11	-0.16	-0.02	-0.02	-0.02
		DJK	-0.29	-0.27	-0.31	-0.28	-0.07	-0.07	-0.20	-0.23	-0.22	-0.22	-0.22	-0.11	0.01	-0.26
		WFZ	-0.22	-0.20	-0.23	-0.21	-0.13	-0.06	-0.15	-0.18	-0.17	-0.17	-0.17	-0.11	-0.11	-0.20
		XL	-0.02	-0.02	-0.02	-0.02	-0.40	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.40	-0.02	-0.32

Table S6. List of Abbreviations

Abbreviation	Full Term
IWDPs	Inter-basin water diversion projects
S	Water supply
H	Hydropower generation
E	Environment conservation
SHE	Water Supply-Hydropower Generation-Environment Conservation
Nexus I	Nexus with inter-basin water diversion projects.
Nexus II	Nexus without inter-basin water diversion projects.
Nexus III	Nexus with the different clusters of inter-basin water diversion projects.
HRB	Hanjiang River Basin
S-Priority	the highest priority is set to water supply
H-Priority	the highest priority is set to hydropower generation
E-Priority	the highest priority is set to environment conservation
the VIC model	The Variable Infiltration Capacity hydrological model
<i>NSE</i>	the Nash-Sutcliffe efficiency coefficient
R^2	Coefficient of determination
<i>PBIAS</i>	Percent bias
the MTMMHC method	The Modified Tennant Method Based on Multilevel Habitat Conditions method
the MIORG model	The Multisource Input-Output Reservoir Generalization model
<i>EFs</i>	ecological flows
<i>LRR</i>	log response ratio
DEM	the Inverse Distance Weighting method. Digital Elevation Model
HWSD	the Harmonized World Soil Database

SWCT

FAO

IIASA

the Soil-Water Characteristics

Food and Agriculture Organization

Institute of Internal Auditors South Africa
