

Supplementary materials

Table S1 Spatial and temporal variation of irrigation hazards

Season	Types	Station	Parameter	SAR	%NA	SSP	MR	PS	Average ion balance error (%)
Pre-monsoon	Surface water	Bamdeb ghat	2019	1.28	34.90	32.52	49.24	3.27	1.70
			2018	0.93	34.18	31.87	49.93	0.63	3.43
			2017	1.41	44.36	41.58	33.02	2.13	6.69
		Suri	2019	1.01	36.74	33.42	50.00	0.90	4.69
			2018	0.94	23.75	22.03	42.94	0.46	5.82
			2017	0.82	29.00	27.26	37.04	0.27	3.80
	Groundwater	Bakreswar	2019	0.98	76.23	76.05	50.00	4.62	-8.09
			2018	0.63	80.55	80.30	20.00	3.40	-16.93
			2017	0.63	80.88	80.65	35.27	2.55	-20.84
		Bolpur	2019	1.67	13.92	13.03	50.00	1.50	4.83
			2018	1.81	16.67	16.12	47.56	4.48	-0.36
			2017	1.37	22.76	22.35	36.45	2.67	3.74
		Nalhati	2019	1.50	37.04	36.72	55.36	7.46	-5.84
			2018	1.44	33.95	33.41	46.15	5.60	3.34
			2017	2.04	19.29	19.09	51.77	3.80	4.47
		Suri	2019	1.25	42.70	40.92	50.00	4.90	-11.51
			2018	1.55	24.04	22.47	42.50	3.78	-8.58
			2017	1.57	25.28	23.18	31.42	3.08	-2.24
Post-monsoon	Surface water	Bamdeb ghat	2019	1.03	44.44	41.96	43.27	1.32	-2.00
			2018	1.01	34.00	32.17	47.55	0.87	3.86
			2017	1.40	21.97	20.05	19.35	1.17	28.51
		Suri	2019	0.86	49.36	46.69	46.75	0.60	-5.69
			2018	0.91	28.58	26.36	50.30	0.48	4.14
			2017	0.85	25.61	23.31	35.69	0.58	1.50
	Groundwater	Bakreswar	2019	0.31	96.18	96.13	39.10	2.67	-54.31
			2018	0.63	88.64	88.38	45.00	5.64	-26.78
			2017	0.55	90.52	90.40	33.33	2.89	-28.51
		Bolpur	2019	1.99	23.02	22.36	2.94	3.58	8.72
			2018	1.60	29.46	28.96	51.56	0.74	9.00

			2017	0.77	73.07	71.43	33.33	5.32	-14.30
		Nalhati	2019	2.26	17.54	17.10	27.52	6.42	5.12
			2018	2.19	18.99	18.46	48.33	8.11	5.39
			2017	1.11	46.60	45.70	51.61	4.04	-8.09
		Suri	2019	1.82	18.56	17.02	53.80	3.01	2.18
			2018	1.91	15.10	14.33	53.85	5.23	2.41
			2017	1.11	39.54	35.94	50.00	3.08	-12.46

Table S2 Spatial and temporal variation of EC, Mg and Na

Water type	Station	year	Pre-monsoon			Post-monsoon		
			Electrical Conductivity (µs/cm)	Magnesium(mg/L)	Sodium (mg/L)	Electrical Conductivity (µs/cm)	Magnesium (mg/L)	Sodium (mg/L)
Surface water	Bamdeb ghat	2019	551.85	19.44	36.475	254	11.03	35.3275
		2018	218.8	10.44	18.75	200.375	11.64	22.25
		2017	639.7	15.7325	65	353	9.16	22.75
	Suri	2019	190.1	12.16	23.4	147.825	8.26	29.66
		2018	160.075	9.12	11.5	153.775	10.08	13.75
		2017	168.825	5.93	11.5	172.425	6.1275	10
	Groundwater	Bakreshwar	2019	636.1	11.52	140.2	531.6	0.89
			2018	550.9	1.92	75	580.7	4.32
			2017	568.2	3.4	77	536.5	2.4
		Bolpur	2019	569.3	33.6	19.3	1056	2.8
			2018	886.8	37.44	29	434	31.68
			2017	528.3	16.52	25	823.5	4.8
		Nalhati	2019	1233	29.76	59.8	1168	33.64
			2018	915.1	23.04	48	955.9	55.68
			2017	931.7	51.52	45	860.4	15.36
		Suri	2019	834.8	18.72	49.7	666.9	42.99
			2018	742.1	24.48	32	753.7	47.04
			2017	708.5	18.47	34	840.8	14.88

Table S3 Spatial and temporal variation of saturation indices of different minerals

Sample type	Station	year	Anhydrite		Gypsum		Sylvite		Halite	
			Pre-mon	Post-mon	Pre-mon	Post-mon	Pre-mon	Post-mon	Pre-mon	Post-mon
Surface water	Bamdeb ghat	2019	-0.51	-0.17	-0.21	0.13	-4.30	-4.76	-4.23	n/a
		2018	-0.60	-0.45	-0.29	-0.15	-5.30	-5.19	-5.23	n/a
		2017	-0.37	-0.18	-0.07	0.12	-4.23	-4.94	-4.18	n/a
	Suri	2019	-0.50	-0.30	-0.20	0.00	-4.90	-5.23	-4.98	n/a
		2018	-0.60	-0.66	-0.30	-0.36	-5.69	-5.51	-5.59	n/a
		2017	-0.66	-0.48	-0.35	-0.17	-6.01	-5.53	-5.85	n/a
Groundwater	Bakreshwar	2019	-0.34	-1.01	-0.04	-0.71	-4.66	-4.79	-3.53	n/a
		2018	-0.46	-0.47	-0.16	-0.17	-4.83	-4.16	-3.91	n/a
		2017	-0.47	-0.50	-0.17	-0.19	-4.97	-4.72	-4.04	n/a
	Bolpur	2019	-0.21	-0.27	0.09	0.02	-5.12	-4.62	-4.89	n/a
		2018	0.30	-0.87	0.60	-0.57	-4.81	-5.48	-4.28	n/a
		2017	-0.12	-0.29	0.18	0.01	-5.25	-3.95	-4.50	n/a
	Nalhati	2019	0.06	0.36	0.35	0.65	-4.72	-4.54	-3.72	n/a
		2018	-0.16	0.15	0.14	0.44	-4.65	-4.36	-3.91	n/a
		2017	0.15	-0.05	0.45	0.25	-5.17	-4.62	-4.15	n/a
	Suri	2019	0.11	0.18	0.41	0.48	-4.26	-4.50	-4.01	n/a
		2018	0.39	0.18	0.69	0.48	-4.54	-4.54	-4.37	n/a
		2017	0.32	0.04	0.62	0.34	-4.44	-4.31	-4.39	n/a