

Table S1. Statistical summary of WQI, PIG, NPI, PLs (in %) and RI parameters determined in groundwater samples of PIA, Bangalore

Well ID	WQI			PIG			NPI			PLs (%)			RI		
	July 2016	Jan 2017	Aug 2017	July 2016	Jan 2017	Aug 2017	July 2016	Jan 2017	Aug 2017	July 2016	Jan 2017	Aug 2017	July 2016	Jan 2017	Aug 2017
P1	120.60	80.84	79.99	1.0141	0.6520	0.5698	4.745	0.5445	1.3475	82.27	56.56	55.01	3.13	0.78	0.75
P2	181.19	118.46	103.65	1.8384	1.1004	0.7214	1.245	0.0000	0.0000	75.14	86.33	53.65	2.75	5.77	0.84
P3	192.67	119.98	113.68	1.6983	0.9976	0.8334	6.015	1.4370	3.0300	81.26	64.34	81.76	3.43	1.41	2.48
P4	184.60	118.58	122.46	1.7090	0.9571	0.8549	4.695	0.9060	2.3700	89.65	71.01	67.78	7.40	2.10	1.55
P5	85.36	96.88	70.316	0.6787	0.7913	0.4477	1.300	3.1730	0.0000	65.43	45.13	50.83	1.12	0.32	0.69
P6	150.87	133.89	135.24	1.3533	1.1708	1.0253	0.875	0.0000	0.0000	87.09	76.70	53.12	5.80	2.86	0.66
P7	123.26	71.16	82.26	0.8411	0.6131	0.5273	4.830	0.1420	0.2550	68.60	30.96	73.28	0.80	0.22	1.59
P8	153.39	118.41	121.84	1.3858	1.0667	0.9167	2.530	0.0000	0.0000	88.58	76.46	56.52	6.62	2.86	0.81
P9	157.0	94.53	94.18	1.4935	0.7660	0.6059	1.845	0.0000	1.0725	66.78	62.10	70.01	1.68	1.30	1.13
P10	179.36	143.27	138.78	1.4941	1.1724	0.9817	0.050	1.2050	1.8575	60.87	82.23	65.75	1.32	3.82	1.14
P11	188.14	117.53	111.51	1.6812	0.8997	0.7920	8.825	0.9835	2.3400	99.99	72.48	87.86	3923.28	1.80	3.78
P12	217.76	188.02	148.58	1.9174	1.5337	1.0993	8.440	5.0850	3.7600	73.86	85.25	82.67	2.14	4.39	2.68
P13	242.45	799.49	426.42	2.4051	8.7571	3.7152	4.610	0.0000	2.2825	77.53	78.43	29.21	3.03	2.26	0.31
P14	438.66	759.31	535.52	4.0766	8.2150	4.4672	22.05	0.5135	4.3200	85.00	93.35	17.43	3.20	3.65	0.11
P15	274.36	272.13	230.06	2.3992	2.2195	1.8812	8.240	4.2550	3.9625	74.31	90.31	93.81	2.30	8.06	12.06
P16	218.56	160.47	184.98	1.6705	1.3191	1.3830	3.960	1.3750	2.1875	78.41	99.98	71.66	3.00	5202.61	1.94
P17	166.29	134.04	117.96	1.4033	1.0174	0.8109	4.765	0.9175	1.8725	58.99	73.41	61.29	1.03	2.18	0.95
P18	248.48	159.53	145.67	2.2384	1.3779	1.0690	8.570	3.4600	2.8450	88.12	93.28	65.43	6.06	11.44	1.25
P19	206.45	151.69	149.45	1.7234	1.3407	1.1236	3.925	3.5665	2.9375	66.05	71.80	68.23	1.55	1.87	1.15
P20	224.25	180.70	156.45	1.9462	1.4895	1.1027	12.45	4.0200	3.3150	90.17	83.72	66.02	6.36	4.15	1.22
P21	182.10	163.94	167.27	1.5302	1.1665	1.1140	7.40	0.9975	1.7175	50.26	15.91	62.74	0.55	0.05	1.16
P22	264.53	189.21	149.43	2.4361	1.5870	1.0922	7.545	1.2835	2.6600	78.59	75.38	99.98	2.48	2.50	4719.01
P23	296.50	224.10	228.71	2.5921	2.0787	2.1595	5.660	0.6355	4.5100	81.78	72.00	80.65	2.94	1.89	3.02
P24	221.35	143.21	154.34	1.9462	1.2268	1.0955	6.650	1.4220	3.3050	89.90	75.53	59.41	7.42	2.56	0.93
P25	189.95	144.43	148.91	1.6117	1.2299	1.1175	4.365	1.4325	3.9850	69.18	73.35	63.81	1.77	2.25	1.00
P26	185.75	139.69	144.89	1.5948	1.1321	1.0178	6.315	1.3540	3.0750	72.67	97.68	58.23	2.04	37.70	0.80
P27	208.04	144.33	146.56	1.6959	1.1655	1.0016	7.775	1.3570	3.1775	68.22	85.27	69.93	1.45	4.88	1.42
P28	222.46	142.77	170.10	2.0493	1.1897	1.1991	4.080	1.3445	3.1375	77.13	87.70	51.12	2.92	6.16	0.64
P29	236.62	189.09	173.35	1.9628	1.6515	1.3523	7.655	1.7355	3.7200	74.18	77.10	58.87	2.19	2.92	0.84
P30	286.96	188.33	161.81	2.5862	1.6287	1.4024	13.10	1.7855	2.9345	75.43	55.61	69.45	2.23	1.01	1.71
P31	208.28	198.22	143.72	1.8144	1.8221	1.1013	7.430	1.4155	3.100	73.27	51.59	83.70	2.03	0.82	3.41
P32	195.86	133.64	144.16	1.9364	1.1379	1.0121	6.015	1.2645	2.8275	70.38	87.65	70.38	1.85	5.97	1.25
P33	185.92	136.68	152.32	1.5022	1.0931	1.0652	7.840	1.5615	3.2500	83.80	88.28	55.12	3.74	6.26	0.73

P34	231.63	142.83	121.36	2.0251	1.1802	0.9398	10.00	1.4080	3.2275	85.02	93.59	55.20	4.35	12.65	0.71
P35	251.71	198.08	141.72	2.2648	1.8010	1.1287	13.70	1.7760	3.9650	81.97	48.63	99.99	3.12	0.77	10539.6
P36	279.80	334.57	113.26	2.6817	3.1299	0.9075	8.350	1.2335	0.0000	80.83	55.72	7.627	3.15	1.00	0.06
P37	201.24	141.51	164.56	1.6887	1.1942	1.1284	8.985	1.4315	2.8025	77.12	72.98	99.97	2.31	2.21	2043.37
P38	164.03	140.00	115.15	1.4601	1.1556	0.8346	2.915	0.4185	2.0675	87.52	78.09	54.49	5.97	3.12	0.65
P39	285.15	205.07	150.74	2.5506	1.8440	1.3044	10.60	1.7115	3.8325	77.18	86.34	78.76	2.60	5.48	1.94
P40	160.30	98.42	156.34	1.3559	0.7341	1.2963	5.130	0.3835	1.9225	59.55	81.08	32.57	0.96	3.33	0.26
P41	185.08	150.73	137.20	1.5780	1.0877	0.9437	7.050	1.2015	3.4825	86.35	71.95	72.97	4.70	2.13	1.44
P42	138.27	114.91	111.80	1.0674	0.8970	0.8007	2.570	0.0000	0.5350	58.93	56.78	54.68	1.15	0.96	0.66
P43	144.14	107.52	105.86	1.2135	0.8052	0.7774	5.785	1.3080	3.2325	94.40	63.02	61.08	12.58	1.32	1.02
P44	184.45	113.15	113.14	1.6521	0.7363	0.7510	4.875	0.0000	1.5750	93.33	58.29	61.17	11.74	1.10	0.96
P45	130.10	95.72	80.86	0.9491	0.6337	0.5007	1.530	0.0000	0.0000	66.31	46.93	55.55	1.52	0.74	0.92
P46	137.87	128.37	123.76	1.2948	1.0445	0.8622	3.725	1.2185	2.9275	92.19	64.52	56.76	9.52	1.45	0.74
P47	137.49	117.08	92.34	1.0202	0.8128	0.5752	4.615	0.0000	0.0000	66.32	50.45	34.51	1.07	0.83	0.34
P48	175.55	124.03	120.84	1.3562	0.8236	0.8365	6.700	1.0240	2.1700	65.12	47.17	58.84	1.16	0.65	0.84
P49	161.54	117.48	113.41	1.3265	0.8388	0.7680	5.720	0.2210	3.1350	77.86	19.94	68.49	2.53	0.13	1.10
P50	118.14	101.57	148.81	0.9896	0.7258	0.9357	2.010	0.9115	2.2700	68.14	31.39	45.84	1.64	0.26	0.47
P51	154.38	157.08	150.10	1.3265	1.1151	0.9210	4.345	1.0295	2.5875	60.89	48.74	65.13	1.09	0.67	1.04
P52	202.99	193.01	168.71	1.8289	1.5418	1.1833	4.145	0.0785	3.5950	93.73	79.71	64.17	12.91	3.60	1.08
P53	208.56	166.79	148.54	1.8099	1.4614	1.0601	2.170	0.0000	0.0000	86.33	90.38	62.74	5.65	8.72	1.37
P54	255.81	171.42	138.67	2.4817	1.3107	0.9998	11.20	1.3965	3.300	79.58	57.07	63.35	3.01	1.06	0.96
P55	193.83	156.18	128.21	1.5023	1.4196	0.9045	2.735	0.0155	1.0575	74.10	94.97	74.69	2.63	17.19	2.25
P56	200.96	134.16	113.67	1.8399	0.9506	0.8376	4.745	1.0335	3.0450	79.56	46.13	63.34	3.24	0.63	0.95
P57	160.86	120.69	123.61	1.3201	0.9453	0.8382	4.430	1.2155	2.7850	73.67	48.74	61.67	2.05	0.67	0.83
P58	107.98	90.53	115.75	0.8329	0.7507	0.6833	0.680	0.6800	0.9750	74.40	70.70	49.43	2.173	1.94	0.67
P59	161.05	162.02	164.64	1.3752	1.1128	1.0302	9.500	1.3220	3.100	89.77	47.72	65.10	5.25	0.63	1.01
P60	176.44	72.81	124.48	1.4602	0.4319	0.9073	6.840	0.0000	3.2275	68.16	71.06	74.88	1.41	1.98	2.19
P61	254.75	186.03	175.55	2.6248	1.7721	1.4716	11.30	1.4515	3.0825	99.99	94.20	83.29	11212.7	15.01	4.36
P62	172.76	112.18	122.75	1.5503	0.8382	0.8053	8.460	1.1560	2.700	79.59	63.73	77.85	2.64	1.28	1.80
P63	216.15	118.34	109.62	1.9366	0.9257	0.8167	7.605	1.4580	3.2925	69.19	70.92	65.53	1.68	1.91	1.01
P64	180.57	124.94	137.03	1.5293	0.9614	0.9733	8.050	1.3855	3.2125	87.05	53.39	64.73	7.16	0.83	0.97
P65	210.73	135.66	126.12	1.8622	0.9694	0.8572	11.35	1.4230	3.200	77.02	40.46	64.84	2.40	0.43	0.82

Table S2. Non-Carcinogenic risk values of July 2016 & January 2017 & August 2017

Parameters		July 2016						January 2017						August 2017					
		Adults			Children			Adults			Children			Adults			Children		
		HQ	HQ	HHI	HQ	HQ	HHI	HQ	HQ	HHI	HQ	HQ	HHI	HQ	HQ	HHI	HQ	HQ	HHI
		Ing	der		Ing	der		Ing	der		Ing	der		Ing	der		Ing	der	
Ca	Min	0.043	0.00011	0.04	0.063	0.0003	0.06	0.018	4.8E-05	0.01	0.026	0.0001	0.02	0.0086	2.2E-05	0.008	0.012	7.7E-05	0.012
	Max	0.484	0.00128	0.48	0.705	0.0043	0.70	1.365	0.0036	1.36	1.988	0.0122	2.00	0.6823	0.0018	0.684	0.993	0.0061	0.999
	Mean	0.156	0.00041	0.15	0.228	0.0014	0.22	0.134	0.0003	0.13	0.195	0.0012	0.19	0.0746	0.0001	0.074	0.108	0.0006	0.109
	SD	0.107	0.00028	0.10	0.157	0.0009	0.15	0.226	0.0006	0.22	0.329	0.0020	0.33	0.1080	0.0002	0.108	0.157	0.0009	0.158
Cl	Min	30.91	0.08211	30.9	45.01	0.2770	45.2	12.92	0.0343	12.9	18.82	0.1158	18.93	17.723	0.0470	17.77	25.80	0.1588	25.9
	Max	524.5	1.39312	525.9	763.7	4.6997	768.4	1732.9	4.6026	1737.	2523	15.527	2538	348.88	0.9266	349.8	507.9	3.1259	511.0
	Mean	216.2	0.57433	216.8	314.8	1.9375	316.7	157.86	0.4192	158.2	229.8	1.4144	231.2	77.933	0.2069	78.14	113.4	0.6982	114.1
	SD	105.8	0.28108	106.1	154.0	0.9482	155.0	280.55	0.7451	281.2	408.4	2.5137	410.9	67.155	0.1783	67.33	97.77	0.6017	98.3
F	Min	0.244	0.00064	0.24	0.355	0.0021	0.35	0.125	0.0003	0.12	0.182	0.0011	0.18	0.1904	0.0005	0.190	0.277	0.0017	0.27
	Max	1.184	0.00314	1.18	1.725	0.0106	1.73	1.404	0.0037	1.40	2.045	0.0125	2.05	0.9761	0.0025	0.978	1.421	0.0087	1.43
	Mean	0.554	0.00147	0.55	0.807	0.0049	0.81	0.526	0.0013	0.52	0.766	0.0047	0.77	0.6059	0.0016	0.607	0.882	0.0054	0.88
	SD	0.253	0.00067	0.25	0.370	0.0022	0.37	0.262	0.0006	0.26	0.381	0.0023	0.38	0.1484	0.0003	0.148	0.216	0.0013	0.21
K	Min	0.050	0.00013	0.05	0.073	0.0004	0.07	0.035	9.4E-05	0.03	0.052	0.0003	0.05	0.0250	0.00006	0.025	0.036	0.0002	0.03
	Max	1.439	0.00382	1.44	2.096	0.0128	2.10	1.517	0.0040	1.52	2.210	0.0136	2.22	1.2642	0.0033	1.267	1.840	0.0113	1.85
	Mean	0.328	0.00087	0.32	0.479	0.0029	0.48	0.238	0.0006	0.23	0.347	0.0021	0.34	0.2502	0.0006	0.250	0.364	0.0022	0.36
	SD	0.231	0.00061	0.23	0.337	0.0020	0.33	0.231	0.0006	0.23	0.337	0.0020	0.33	0.2324	0.0006	0.233	0.338	0.0020	0.34
Mg	Min	0.002	7.7E-06	0.002	0.004	2.6E-05	0.004	0.004	1.1E-05	0.004	0.006	3.1E-05	0.006	0.0064	1.7E-05	0.006	0.009	5.8E-05	0.009
	Max	1.023	0.00271	1.02	1.490	0.0091	1.49	3.545	0.0094	3.55	5.162	0.0317	5.19	1.2889	0.0034	1.292	1.876	0.0115	1.88
	Mean	0.216	0.00057	0.21	0.316	0.0019	0.31	0.129	0.0003	0.12	0.188	0.0011	0.18	0.0671	0.0001	0.067	0.097	0.0006	0.09
	SD	0.226	0.00060	0.22	0.330	0.0020	0.33	0.570	0.0015	0.57	0.831	0.0051	0.83	0.2123	0.0005	0.212	0.309	0.0019	0.31
NO₃	Min	0.468	0.00124	0.46	0.683	0.0042	0.68	0.022	5.9E-05	0.02	0.032	0.0002	0.03	0.0312	0.00008	0.031	0.045	0.0002	0.04
	Max	10.29	0.02733	10.3	14.98	0.0922	15.07	2.716	0.0072	2.72	3.955	0.0243	3.97	2.4598	0.00653	2.466	3.581	0.0220	3.60
	Mean	2.820	0.00749	2.82	4.106	0.0252	4.13	0.761	0.0020	0.76	1.108	0.0068	1.11	1.2166	0.00323	1.219	1.771	0.0109	1.78
	SD	1.659	0.00440	1.66	2.415	0.0148	2.43	0.519	0.0013	0.52	0.756	0.0046	0.76	0.6171	0.00163	0.618	0.898	0.0055	0.90

NOTE: Min=Minimum; Max=Maximum; SD=Standard Deviation; HQ_{ing}= Hazard Quotient Ingestion; HQ_{der}= Hazard Quotient Dermal; HHI=Health Hazardous Index

Table S3. Principal component analysis of heavy metals in groundwater samples collected from study area at different periods

Parameters	July 2016					January 2017					August 2017		
	Component					Component					Component		
	PC-1	PC-2	PC-3	PC-4	PC-5	PC-1	PC-2	PC-3	PC-4	PC-5	PC-1	PC-2	PC-3
Ca	0.741	0.581	-0.103	0.075	-0.010	0.947	0.131	0.000	-0.151	-0.074	0.864	0.234	0.310
NO ₃	0.670	0.029	0.227	0.126	0.047	-0.100	-0.055	0.944	-0.027	0.036	0.072	0.851	0.005
F	-0.665	0.138	-0.026	0.208	-0.021	0.517	0.029	0.483	0.108	0.019	0.399	-0.376	-0.104
SO ₄	0.478	0.405	0.229	0.338	0.235	0.562	0.411	0.312	-0.220	-0.108	0.466	0.433	0.466
HCO ₃	-0.036	0.811	0.102	-0.136	-0.217	-0.171	0.177	-0.016	0.907	-0.026	0.945	0.102	0.044
Na	0.052	0.743	0.022	0.261	0.226	0.534	0.617	-0.068	-0.023	-0.121	0.597	0.314	0.376
EC	0.590	0.610	0.500	0.133	0.097	0.963	0.211	0.066	-0.030	-0.066	0.933	0.272	-0.185
TDS	0.590	0.610	0.500	0.133	0.097	0.961	0.139	0.059	-0.025	0.195	0.933	0.272	-0.185
Mg	0.006	-0.057	0.984	-0.026	0.005	0.977	0.021	-0.017	-0.002	0.015	0.946	0.093	0.153
Cl	0.497	0.309	0.653	0.042	0.156	0.962	0.117	0.019	-0.093	-0.088	0.327	0.495	0.511
Hardness	0.601	0.425	0.645	0.041	-0.004	NA					0.927	0.174	0.244
CO ₃	-0.085	0.172	0.012	0.824	0.136	-0.019	-0.017	0.034	-0.028	0.993	0.155	0.133	-0.892
pH	-0.128	0.096	-0.003	-0.779	0.397	-0.653	0.372	-0.239	-0.440	0.048	-0.927	0.025	-0.002
Initial Eigen value	5.87	1.68	1.61	1.11	1.07	7.19	1.45	1.23	1.08	1.02	7.56	1.74	1.18
% Variance	41.92	11.99	9.32	7.92	7.64	51.35	10.37	8.77	7.74	7.28	54.03	12.43	8.44
% Cumulative	41.9	53.92	63.24	71.16	78.80	51.35	61.72	70.49	78.22	85.50	54.03	66.45	74.89

Bold= Strong positive loadin

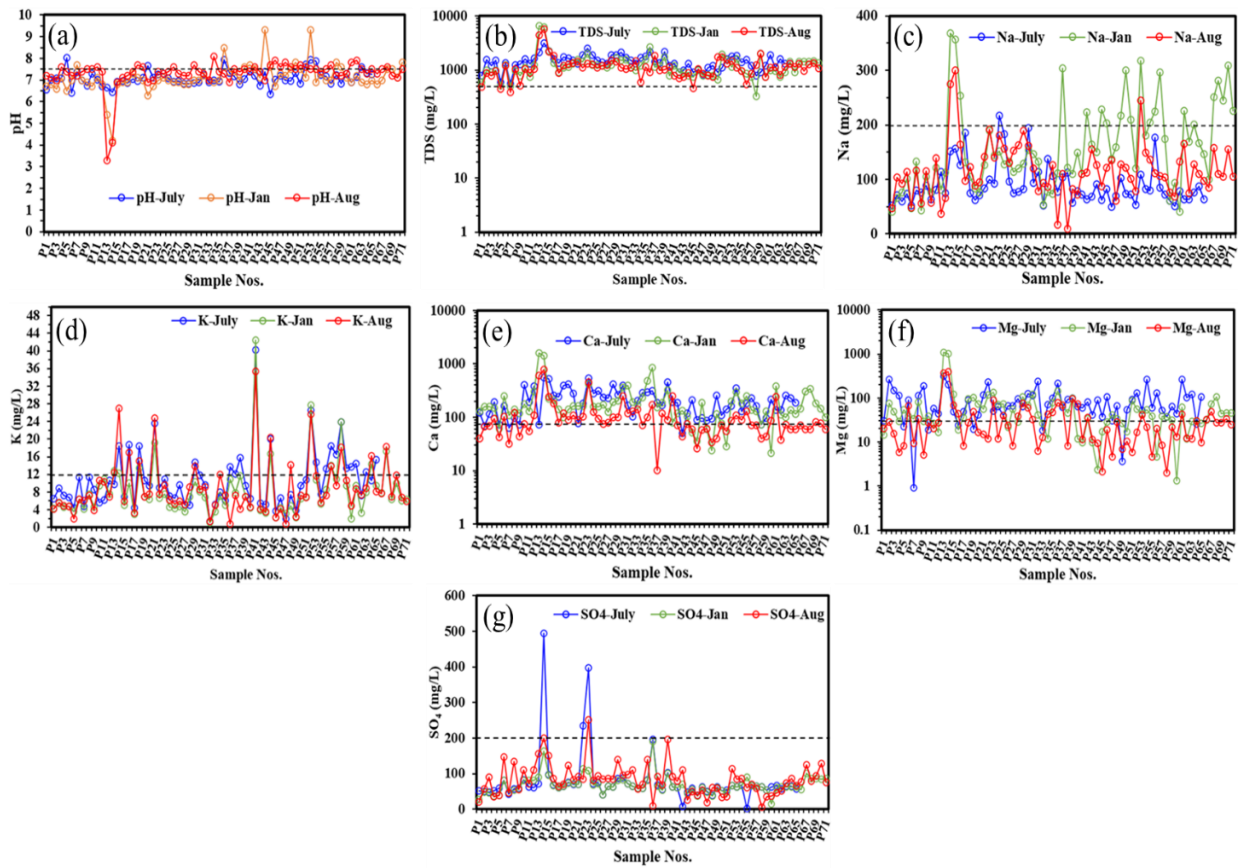


Fig.S1. (a-g). Distribution of Major ions

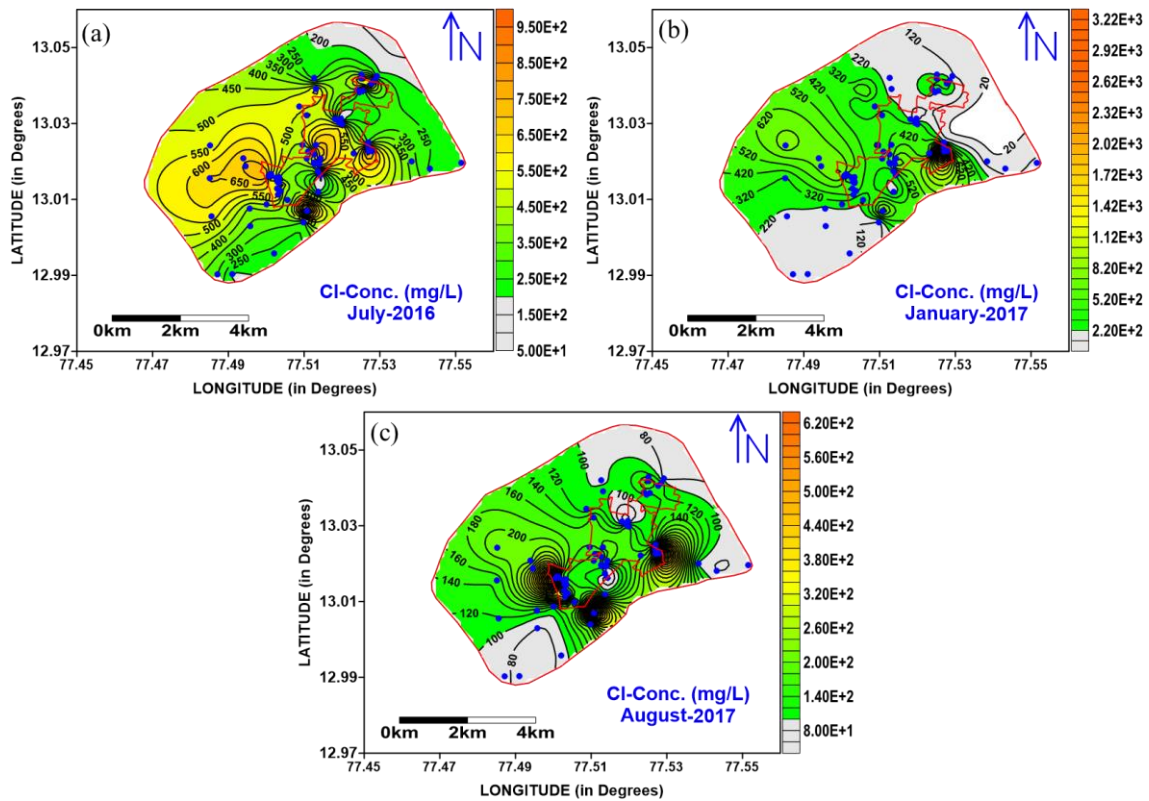


Fig.S2. (a-c). Spatial distribution maps of Chloride from July 2016, January 2017 and August 2017

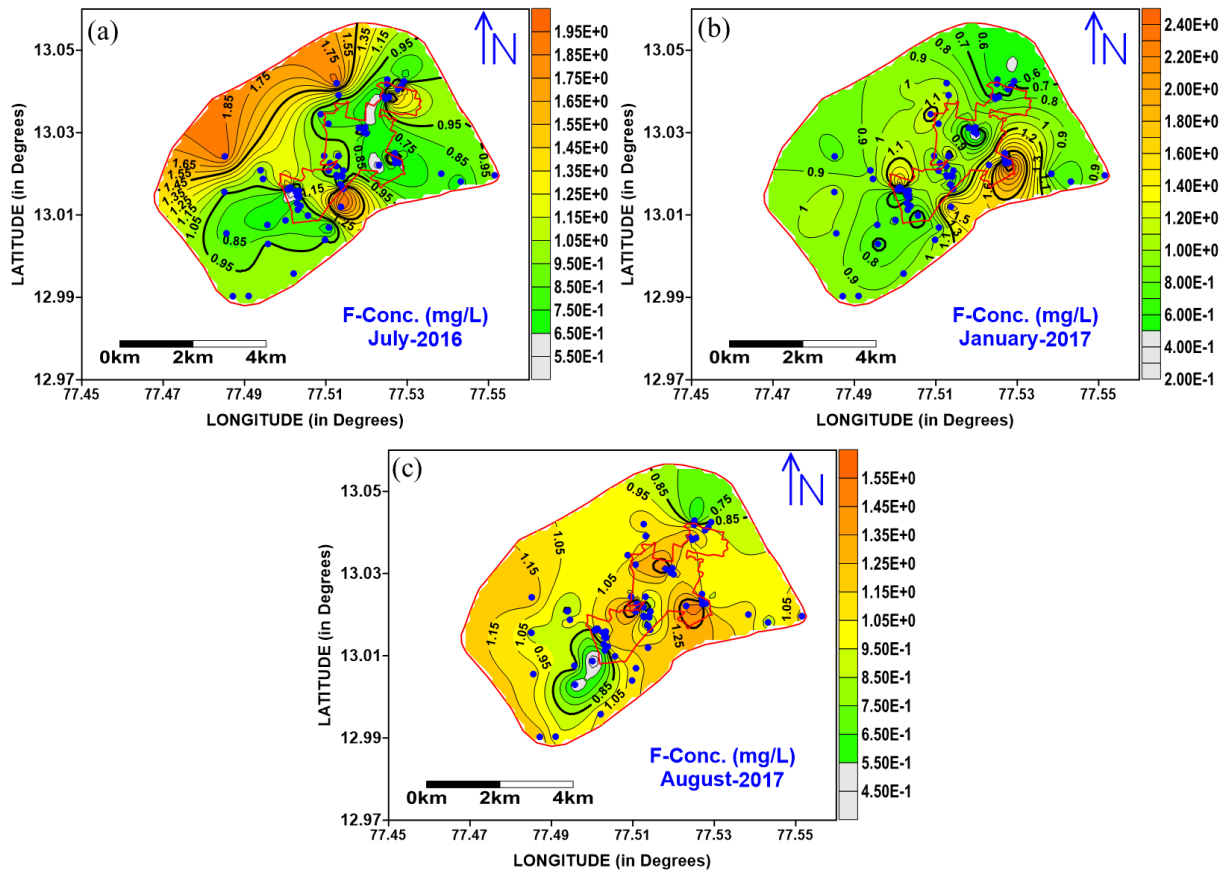


Fig.S3. (a-c). Spatial distribution maps of Fluoride from July 2016, January 2017 and August 2017

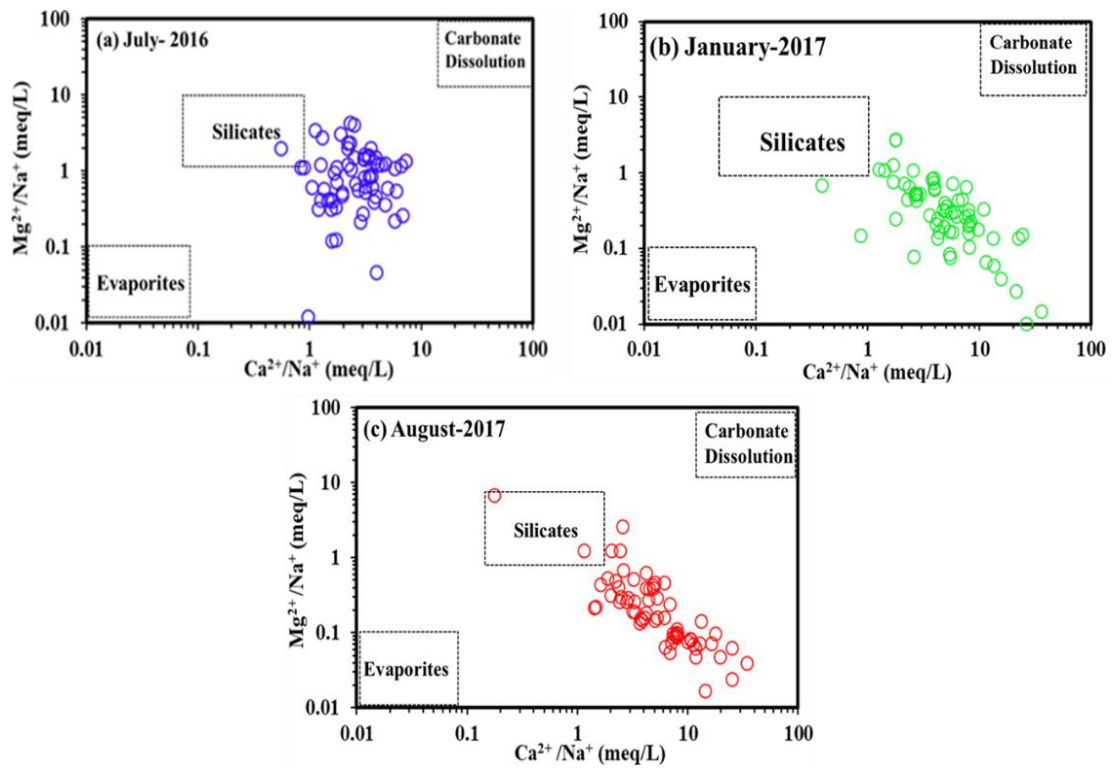


Fig.S4. (a-c). Scatter plot between $\text{Ca}^{2+}/\text{Na}^{+}$ vs $\text{Mg}^{2+}/\text{Na}^{+}$

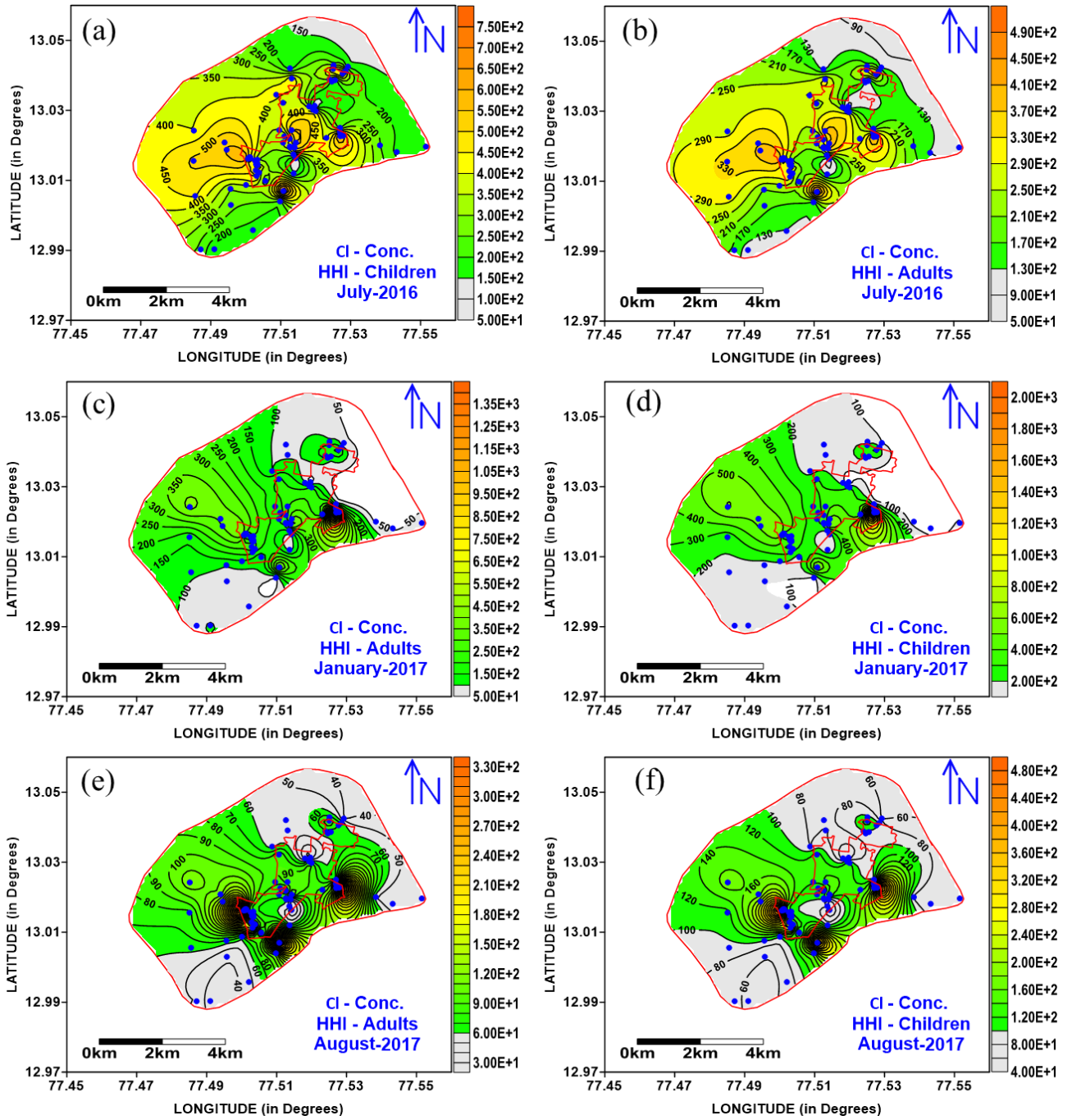


Fig.S5. (a-f). Spatial distribution maps of Health Hazard Index (HHI) for Chloride in July 2016, January 2017 and August 2017

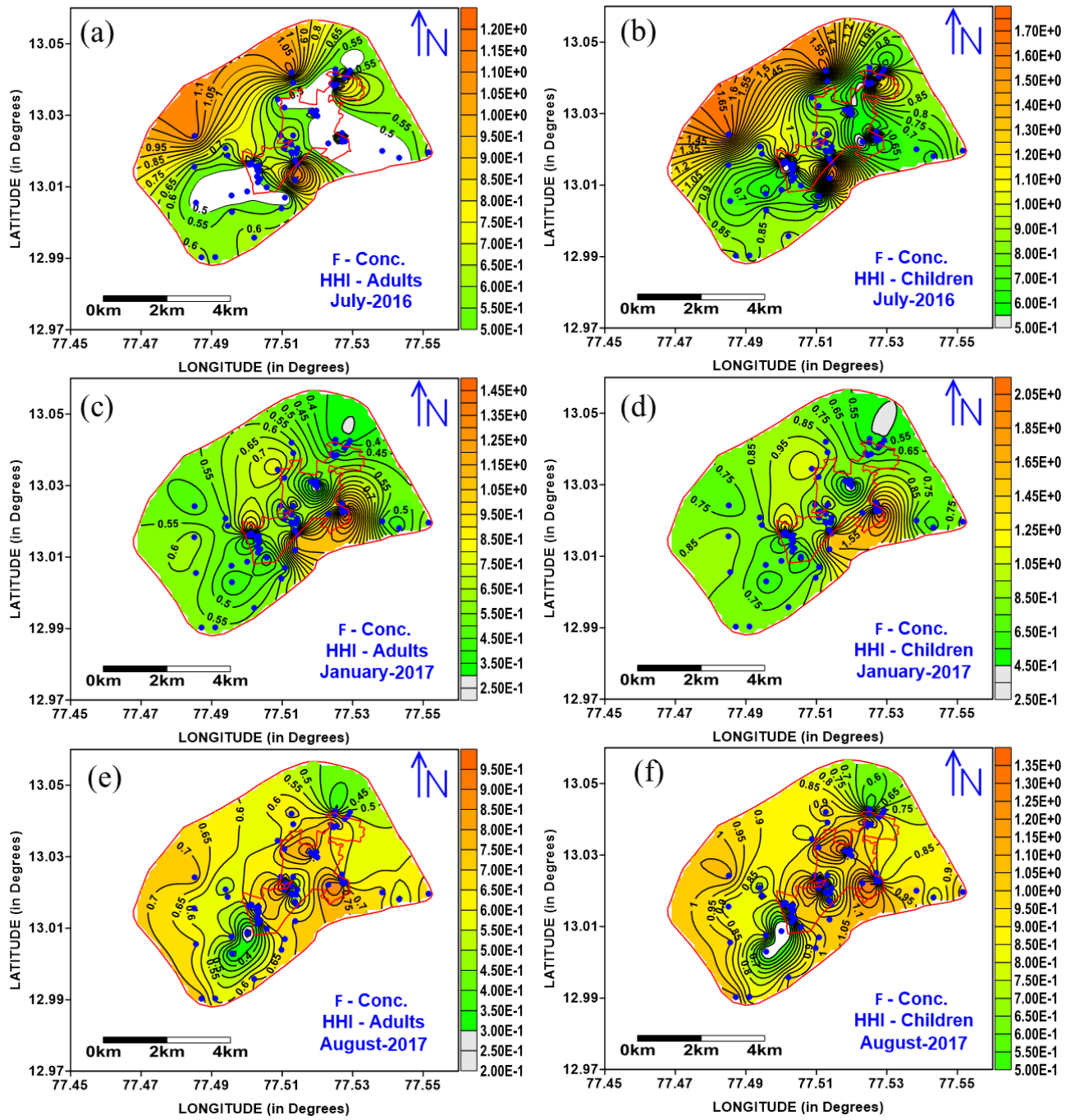


Fig.S6. (a-f). Spatial distribution maps of Health Hazard Index (HHI) for Fluoride in July 2016, January 2017 and August 2017