Flood risk assessment for Indian sub-continental river basins

Urmin Vegad[1], Yadu Pokhrel[2], and Vimal Mishra[1,3*]

[1]Civil Engineering, Indian Institute of Technology (IIT) Gandhinagar

[2]Civil Engineering, Michigan State University, East Lansing

[3]Earth Sciences, Indian Institute of Technology (IIT) Gandhinagar

*Corresponding author: vmishra@iitgn.ac.in
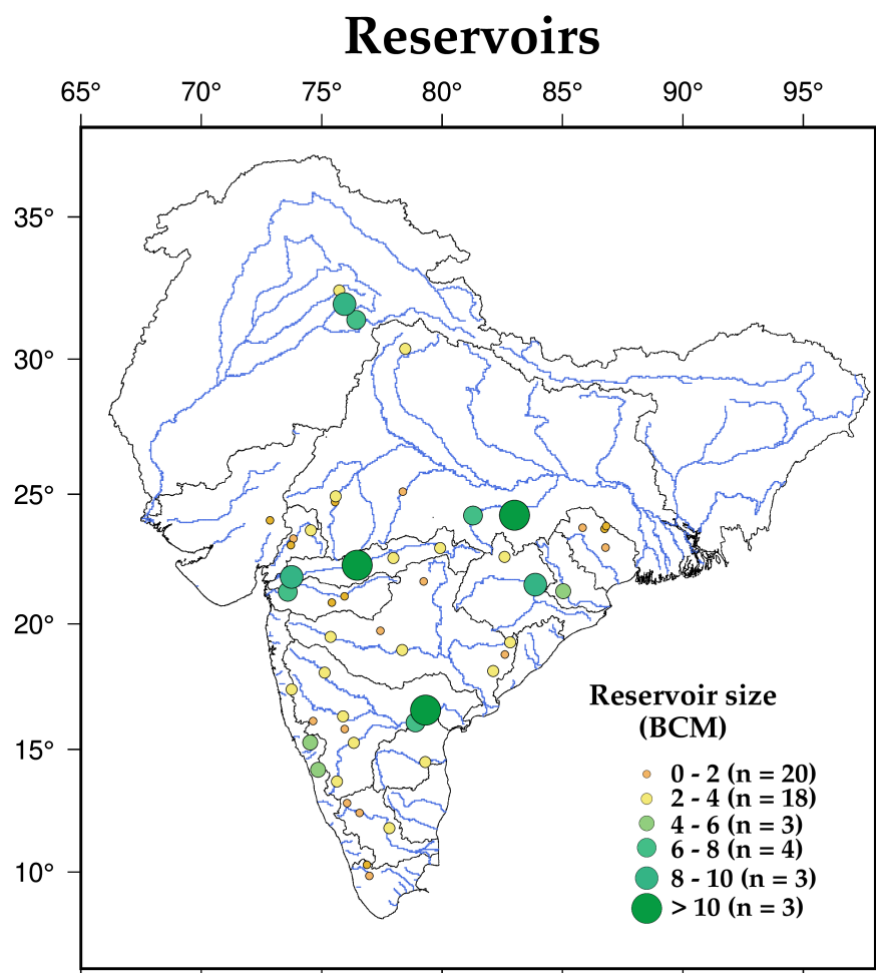
Figure S1. Dams locations and storage capacity in Billion Cubic Meters (BCM)
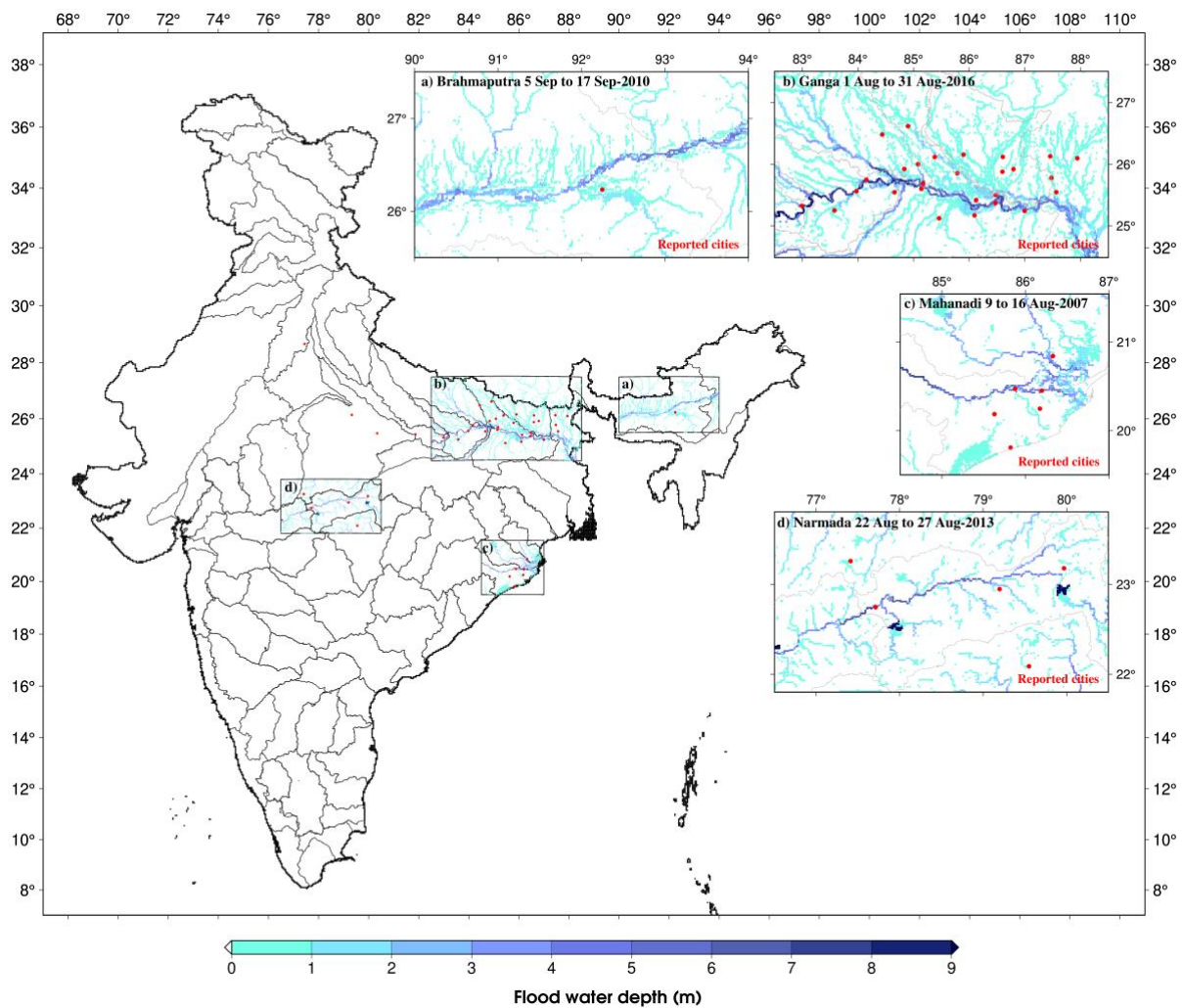
Figure S2. Simulated flood occurrence compared with reported flood cities from EMDAT and/or DFO (a) Brahmaputra River basin 5 September 2010 to 17 September 2010 (b) Ganga River basin 1 August 2016 to 31 August 2016 (c) Mahanadi River basin 9 August 2007 to 16 August 2007 (d) Narmada River basin 22 August 2013 to 27 August 2013

Table S1 - Dams location, storage capacity and purpose details (Purpose Abbreviation: I-irrigation, H-hydropower, S-water supply, F-fish production, C-flood control, O-other benefits, T-tourism, N-navigation)

Sr No.	Basin	Dam	Lat	Long	Total storage (BCM)	Live storage (BCM)	Purpose
1	Narmada	Indira Sagar	22.2846	76.4721	12.22	9.75	I/H
2	Krishna	Nagarjun Sagar	16.5761	79.3135	11.55	6.92	I/H
3	Ganga	Rihand	24.2028	83.0057	10.6	8.9	I/H
4	Indus	Pong	31.9662	75.9456	9.621	7.29	I/H/C
5	Narmada	Sardar Sarovar	21.8305	73.7501	9.5	5.8	I/H/N/S/C/F/O
6	Mahanadi	Hirakud	21.5338	83.8751	8.136	5.818	I/H/S/D/T/C
7	Indus	Bhakra	31.4107	76.4331	7.551	6.007	I/H/T/C/F
8	Tapi	Ukai	21.2504	73.5913	7.41429	6.729896	I/H/C
9	Ganga	Bansagar	24.1902	81.2862	6.37	5.43	I/H/S
10	Krishna	Srisailam	16.0867	78.8971	6.116438863	5.833270398	H
11	Brahmani	Rengali	21.2765	85.0345	5.15	3.41371	I/H/C
12	West Coast	Linganamakki	14.1756	74.8466	4.43535	4.29394	H
13	West Coast	Supa	15.2759	74.5265	4.178	4.115	H
14	Narmada	Bargi	22.9416	79.9236	3.92	3.18	I/H/S
15	Krishna	Tungabhadra	15.2639	76.3339	3.7378237 5	3.308540356	I/H/S/D/T/F

16	Godavari	Balimela	18.1411	82.1215	3.61	2.6759	I/H
17	Ganga	Tehri	30.37	78.47	3.54	2.615	I/H
18	Krishna	Almatti	16.33099	75.8868	3.485237478	2.985445136	I/H
19	Mahanadi	Bango	22.6052	82.5979	3.416	2.894	I/H
20	Krishna	Ujjaini	18.07433	75.1198	3.32001	1.5172	I/S
21	Indus	Thein	32.4439	75.7304	3.28	2.344	I/H/C
22	Godavari	Sriram Sagar	18.96855	78.3414	3.172	2.322	I/H/S
23	Krishna	Koyna	17.40266	73.75088	2.98068	2.83554	I/H
24	Godavari	Jayakwadi Stage 1	19.48499	75.37055	2.909	2.17093	I/H
25	Ganga	Ranapratap Sagar	24.91766	75.58399	2.89869	1.56653	I/H/S
26	Cauvery	Mettur	11.80133	77.80889	2.708764	2.647	I/H/D/T
27	Narmada	Tawa	22.56266	77.977	2.311542	1.943965	I
28	Godavari	Upper Indrawati	19.27422	82.8294	2.3	1.5	I/H
29	Pennar	Somasila	14.489	79.3046	2.20837	1.9941	I/H
30	Mahi	Mahi	23.62855	74.5471	2.180376	1.8335	I/H/S/O
31	Krishna	Bhadra	13.70111	75.6363	2.02587	1.785	I/H/S
32	South Coast	Idukki	9.8429	76.97611	1.9963	1.45951	I/H/S/C
33	Mahi	Kadana	23.30557	73.8253	1.542	1.203	I/H/F
34	Krishna	Hidkal	16.14255	74.6425	1.44869	1.32183	I/H/S

35	Cauvery	Krishnaraja Sagar	12.4253	76.5723	1.4	1.27569	I
36	Godavari	Isapur	19.7271	77.4359	1.279	0.964	I
37	Godavari	Upper Kolab	18.7928	82.6079	1.215	0.935	I/H/S
38	Godavari	Totladoh	21.6587	79.2319	1.16693	1.01693	H
39	Ganga	Matatila	25.0978	78.3728	1.132	1.0194	I/H
40	Krishna	Malaprabha	15.8166	75.9533	1.068	0.83025	I/H/N/S/D/T/C/F/O
41	Cauvery	Hemavathy	12.8219	76.0544	1.05063	1.01261	I/H/S/D/T/F/O
42	Subernarekha	Kangsabati	22.9636	86.789	1.04	0.9004	I
43	Subernarekha	Tenughat	23.7252	85.8361	1.0209	0.99992	I/H
44	Sabarmati	Dharoi	24.0045	72.8539	0.90788	0.13199	I/S
45	Mahi	Panam	23.0542	73.7167	0.7376	0.69884	I/H/S/F
46	Tapi	Girna	20.8329	75.4237	0.60845	0.52355	I/H
47	Subernarekha	Maithon	23.7851	86.8119	0.534	0.441	I/H/S/T/C
48	Tapi	Hatnur	21.0735	75.9454	0.388	0.255	I
49	Subernarekha	Panchet	23.6808	86.7471	0.275	0.169	I/H/S/C
50	South Coast	Sholayar	10.2979	76.8804	0.16	0.1525	I/H
51	Ganga	Gandhisagar	24.7008	75.5523	0.07322	0.067974	I/H