



Supplement of

Flood risk assessment for Indian sub-continental river basins

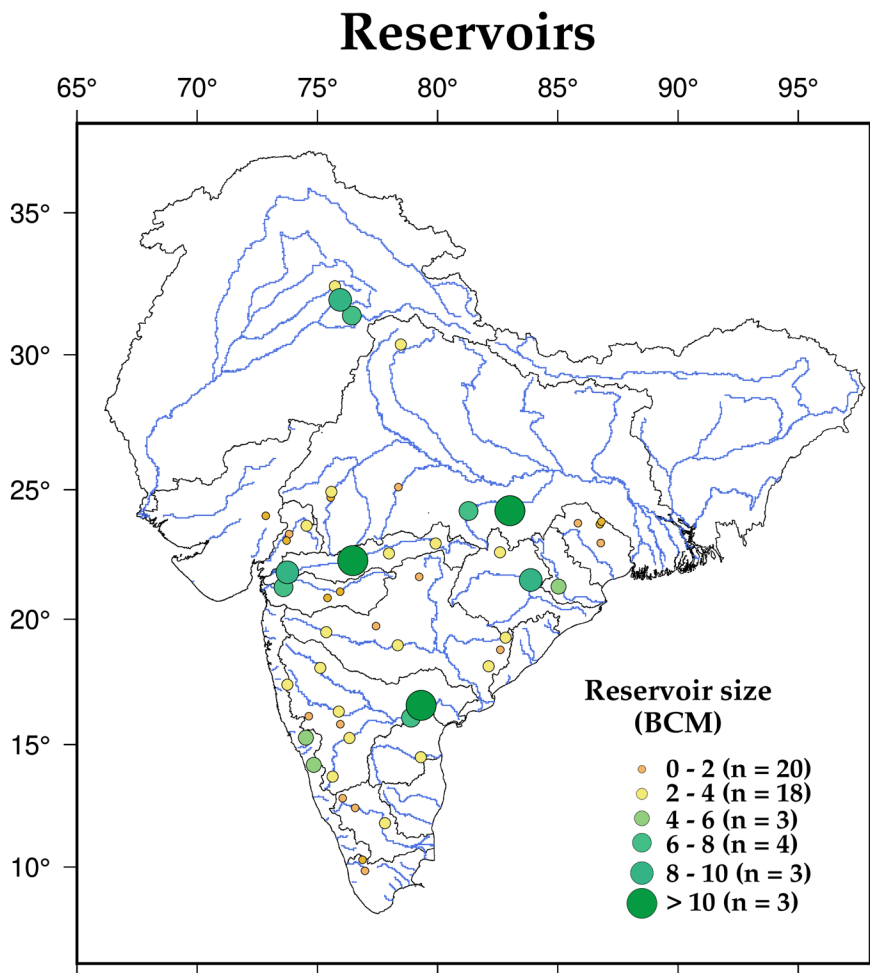
Urmin Vegad et al.

Correspondence to: Vimal Mishra (vmishra@iitgn.ac.in)

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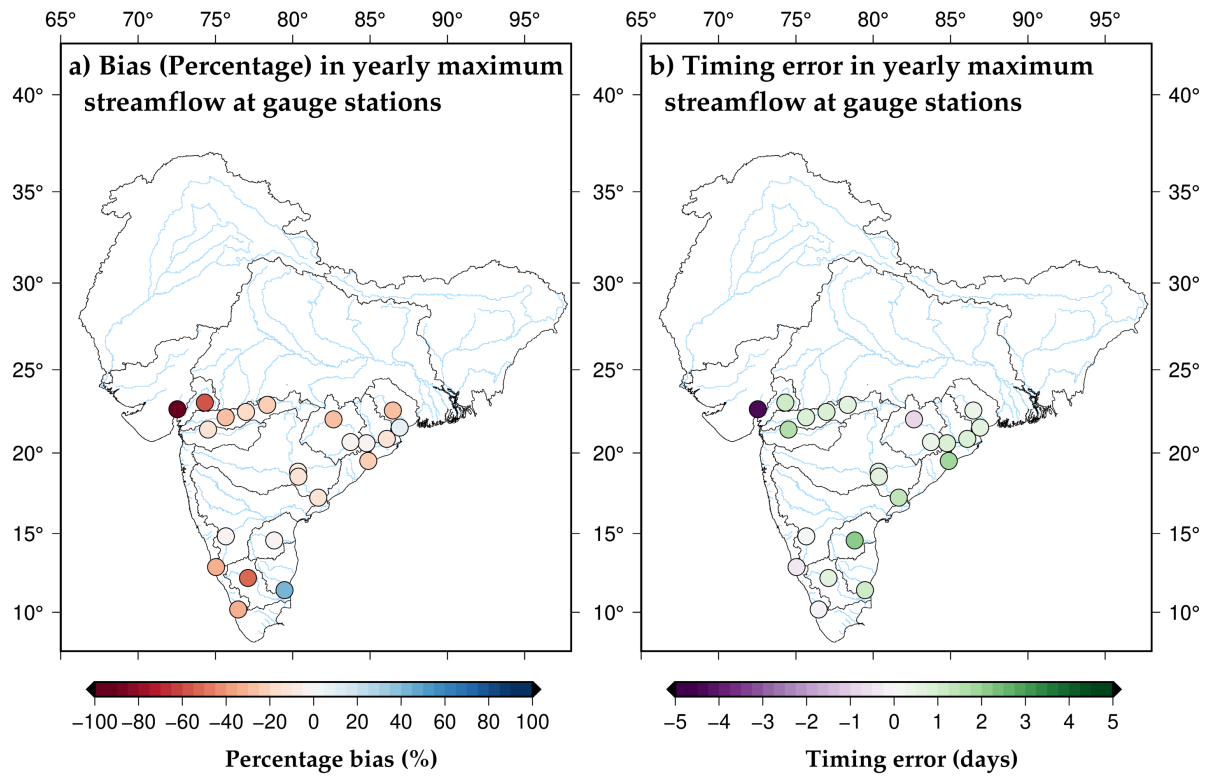
Supplemental Information

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Figure S1. Dams locations and storage capacity in Billion Cubic Meters (BCM)

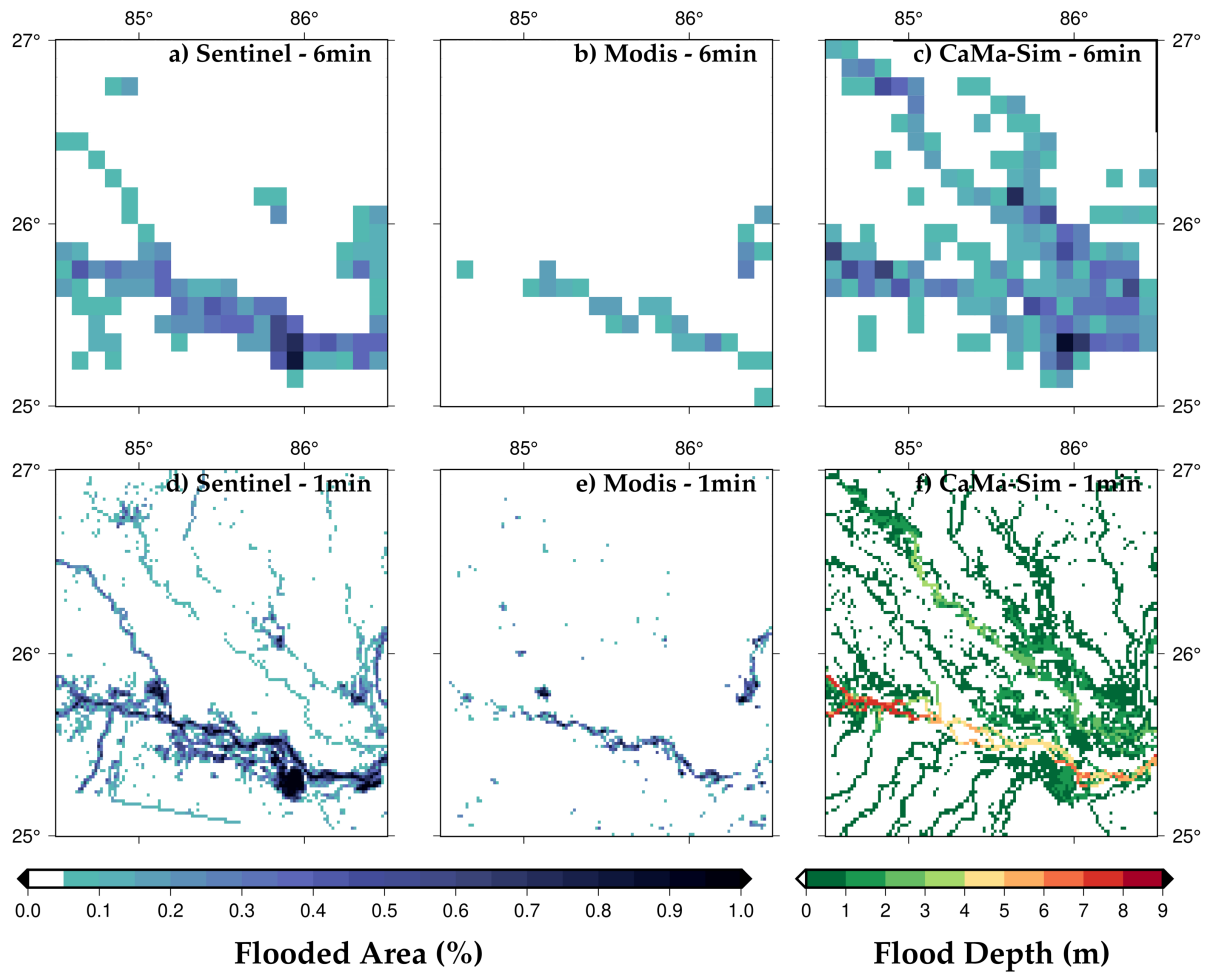


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15 **Figure S2: a) Bias (percentage) and b) Timing error in the simulation of yearly maximum**
 16 **streamflow events**

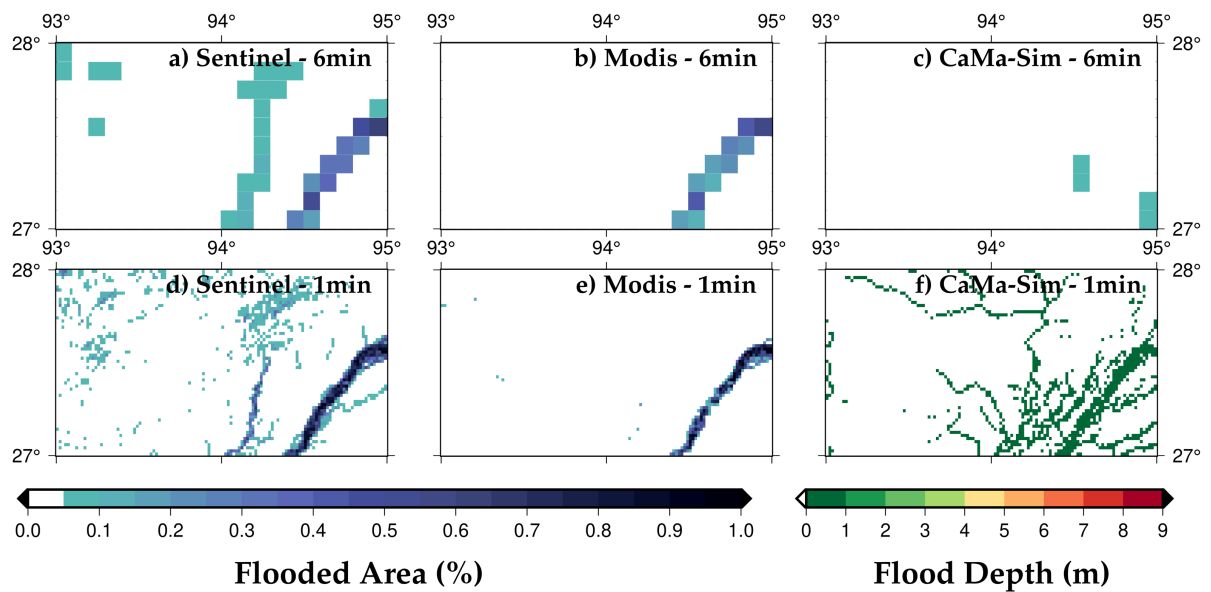
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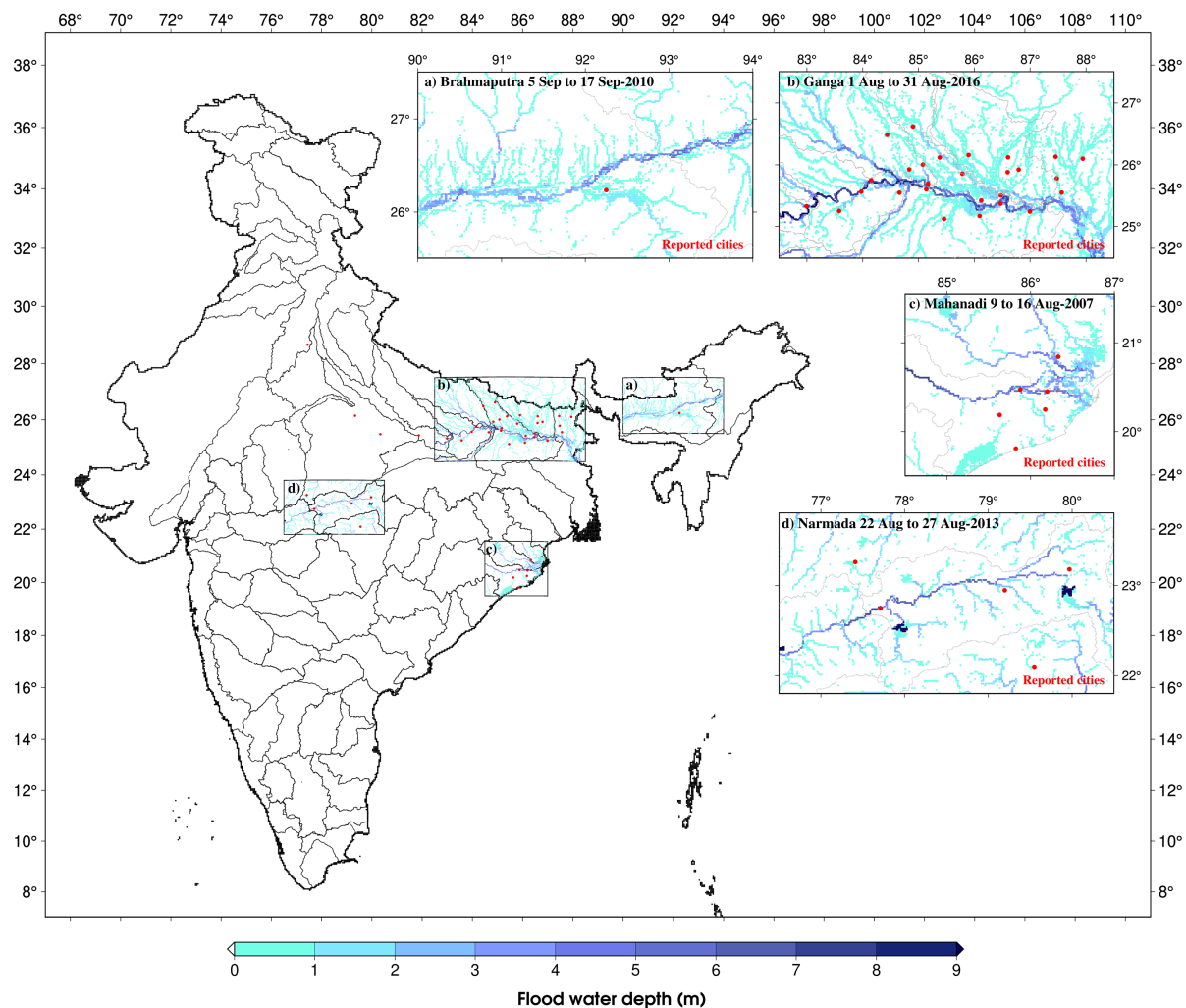
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20 **Figure S3: Simulated flood extent compared with Sentinel-1 SAR and MODIS satellite-based**
 21 **observed flood extent for the 2016 flood event in the Ganga river basin**



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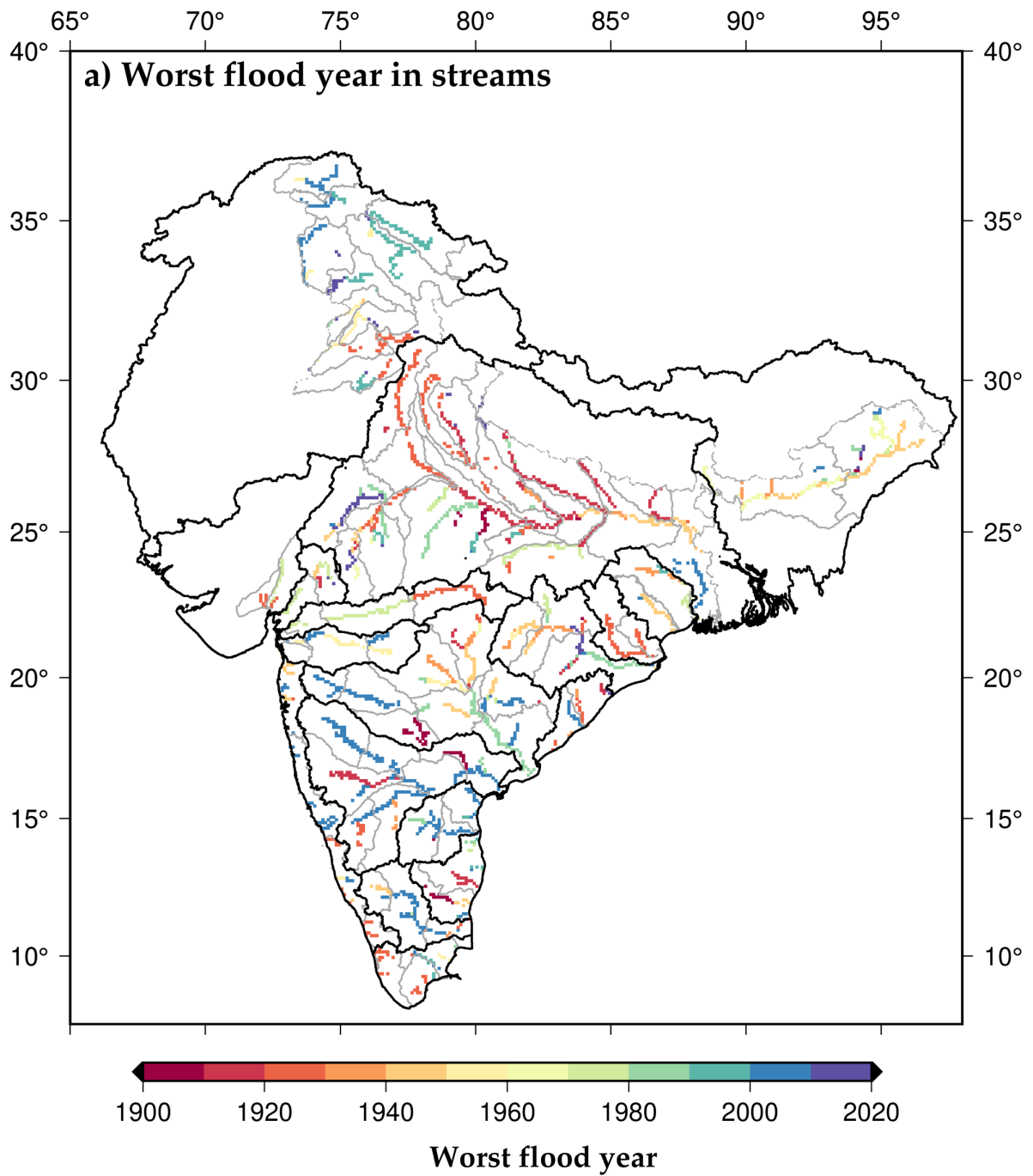
23 **Figure S4: Simulated flood extent compared with Sentinel-1 SAR and MODIS satellite-based**
 24 **observed flood extent for the 2019 flood event in the Brahmaputra river basin**



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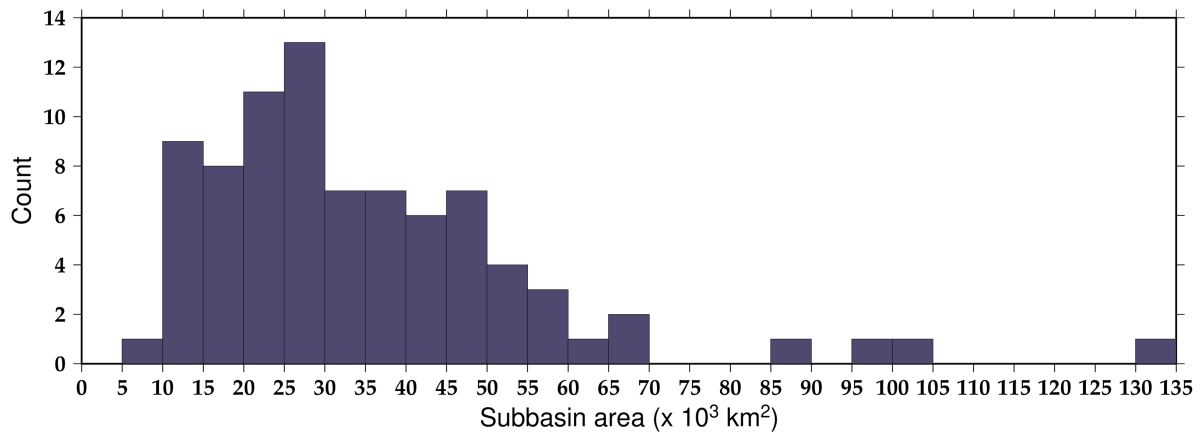
27 **Figure S5. Simulated flood occurrence compared with reported flood cities from EMDAT**
28 **and/or DFO (a) Brahmaputra River basin 5 September 2010 to 17 September 2010 (b) Ganga**
29 **River basin 1 August 2016 to 31 August 2016 (c) Mahanadi River basin 9 August 2007 to 16**
30 **August 2007 (d) Narmada River basin 22 August 2013 to 27 August 2013**

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33 **Figure S6. Heat map illustrating worst flood year in different streams**



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35 **Figure S7. Histogram of subbasin area showing the number of subbasin falling in each interval.**

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

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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	Srisaillam	16.0867	78.8971	6.11643 8863	5.8332703 98	H
11	Brahmani	Rengali	21.2765	85.034	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	76.333	3.73782 375	3.3085403 56	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	16.3309	75.8868	3.48523 7478	2.9854451 36	I/H
19	Mahanadi	Bango	22.6052	82.5979	3.416	2.894	I/H
20	Krishna	Ujjaini	18.0743	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	18.9685	78.3414	3.172	2.322	I/H/S
23	Ganga	Ramganga	29.5153	78.7561	6.14	5.34	I
24	Godavari	Jayakwadi Stage 1	19.4849	75.3705	2.909	2.17093	I/H
25	Ganga	Ranapratap Sagar	24.9176	75.5839	2.89869	1.56653	I/H/S
26	Cauvery	Mettur	11.8013	77.8089	2.70876 4	2.647	I/H/D/T
27	Narmada	Tawa	22.5626	77.977	2.31154 2	1.943965	I
28	Godavari	Upper Indrawati	19.2742	82.8294	2.3	1.5	I/H
29	Pennar	Somasila	14.489	79.3046	2.20837	1.9941	I/H
30	Mahi	Mahi	23.6285	74.5471	2.18037 6	1.8335	I/H/S/O
31	Krishna	Bhadra	13.7011	75.6363	2.02587	1.785	I/H/S
32	South Coast	Idukki	9.8429	76.9761	1.9963	1.45951	I/H/S/C
33	Mahi	Kadana	23.3057	73.8253	1.542	1.203	I/H/F
34	Krishna	Hidkal	16.1425	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

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47 **Table S2 - Critical parameters value corresponding to each basin used in the evaluation of the**

48 **H08 model.**

Sr No.	Basin	Sd	Cd	Gamma	Tau
	(Range) >	(0.5-5)	(0.001-0.01)	(1-4)	(30-300)
1	Brahmani	1.7	0.004	2.8	105
2	Brahmputra	2.1	0.001	2.1	155
3	Cauvery	1.2	0.0025	2.1	105
4	East Coast	2.2	0.005	2.8	70
5	Ganga	2.1	0.002	3.6	105
6	Godavari	2.8	0.003	2.8	105
7	Indus	1	0.00075	1.0	155
8	Krishna	1.7	0.0035	1.5	155
9	Mahanadi	2.8	0.002	2.8	105
10	Mahi	2.6	0.004	2.1	105
11	Narmada	2.3	0.004	2.8	70
12	North East Coast	2.85	0.004	3.6	155
13	Pennar	1.65	0.0035	2.1	120
14	Sabarmati	3.2	0.004	3.6	70
15	South Coast	0.5	0.001	2.1	70
16	Subernarekha	2.2	0.002	2.8	70
17	Tapi	2.1	0.002	3.6	155
18	West Coast	1	0.001	3.6	70

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