

Uttarakhand: Existing, under construction and proposed Hydropower Projects: How do they add to the disaster potential in Uttarakhand?

As Uttarakhand faced unprecedented flood disaster and as the issue of contribution of hydropower projects in this disaster was debated, one question for which there was no clear answer is, how many hydropower projects are there in various river basins of Uttarakhand? How many of them are operating hydropower projects, how many are under construction and how many more are planned? How projects are large (over 25 MW installed capacity), small (1-25 MW) and mini-mirco (less than 1 MW installed capacity) in various basins at various stages. This document tries to give a picture of the status of various hydropower projects in various sub basins in Uttarakhand, giving a break up of projects at various stages.

Uttarakhand has 98 operating hydropower projects (all sizes) with combined capacity close to 3600 MW. However, out of this capacity, about 1800 MW is in central sector and 503 MW in private sector, making it uncertain how much power from these projects the state will get. Moreover, it is universally true that local communities never get the power from large hydro projects.

River Basins in Uttarakhand Entire Uttarakhand is part of larger Ganga basin. The Ganga River is a trans-boundary river of India and Bangladesh. The 2,525 km long river rises in the western Himalayas in the Indian state of Uttarakhand, and flows south and east through the Gangetic Plain of North India into Bangladesh, where it empties into the Bay of Bengal. The Ganga begins at the confluence of the Bhagirathi and Alaknanda rivers and forms what we have called Ganga sub basin till the Ganga river exits Uttarakhand. Besides Bhagirathi, Alaknanda and Ganga sub basin, other river basins of Uttarakhand include: Yamuna, Ramganga (Western

Ramganga is taken as Ramganga basin in this document, eastern Ramganga is considered part of Sharda basin) and Sharda. Sharda sub basin includes eastern Ramganga, Goriganga, Dhauliganga, Kaliganga and part of Mahakali basin.

Existing hydropower projects in Uttarakhand In the table below we have given the sub basin wise list of existing hydropower projects in Uttarakhand along with their capacities. The list has been prepared based on various sources including Central Electricity Authority, Uttarakhand Jal Vidhyut Nigam (UJVNL), Uttarakhand Renewable Energy Development Authority (UREDA) and Report of Inter Ministerial Group on Ganga basin.

Table 1: Existing Hydropower projects in Uttarakhand

Projects	Installed Capacity (MW)
Projects in Alaknanda River Basin	
1. Vishnu Prayag (P)	400
2. Tilwara	0.2
3. Soneprayag	0.5
4. Urgam	3
5. Badrinath II	1.25
6. Rajwakti (P)	3.6
7. Tapowan	1
8. Jummagad	1.2
9. Birahi Ganga (P)	7.2
10. Deval (P Chamoli Hydro P Ltd on Pinder)	5
11. Rishiganga (P)	13.5
12. Vanala (P Hima Urja P Ltd Banala stream)	15
13. Kaliganga I (ADB)	4
Alaknanda Total	455.45
Projects in Bhagirathi River Basin	
14. Maneri Bhali-1 (Tiloth)	90
15. Maneri Bahli-2	304
16. Tehri St-I	1000
17. Koteswar	400
18. Harsil	0.2
19. Pilangad	2.25
20. Agunda Thati (P Gunsola hydro Balganga river)	3
21. Bhilangana (P - Swasti)	22.5

22. Bhilangana III (P - Polyplex)	24
23. Hanuman Ganga (P – Regency Aqua)	4.95
Bhagirathi Total	1850.9
Projects in Ganga River sub basin downstream of confluence of Bhagirathi and Alaknanda	
24. Chilla	144
25. Pathri	20.4
26. Mohamadpur	9.3
Ganga sub basin Total	173.7
Projects in Ramganga basin	
27. Ramganga	198
28. Surag	7
29. Loharkhet (P Parvatiya Power P Ltd Bageshwar)	4.8
30. Kotabagh	0.2
31. Sapteshwar	0.3
32. Gauri	0.2
Ramganga Total	210.5
Projects in Sharda River Basin	
33. Dhauliganga	280
34. Tanakpur	94.2
35. Khatima	41.4
36. Chirkilla	1.5
37. Taleshwar	0.6
38. Suringad	0.8
39. Relagad	3
40. Garaon	0.3
41. Charandev	0.4
42. Barar	0.75
43. Kulagad	1.2
44. Kanchauti	2
Sharda Total	426.15
Projects in Yamuna River Basin	
45. Chibro	240
46. Dhakrani	33.75
47. Dhalipur	51
48. Kulhal	30
49. Khodri	120
50. Galogi	3
51. Tharali	0.4
Yamuna Total	478.15
Grand Total	3594.85

Note: (P) in the bracket suggests the project is in private sector, throughout this document. The eastern Ramganga river, which is part of Sharda basin, is included in Sharda basin. Where-ever Ramganga river is mentioned in this document, it refers to Western Ramganga, which is a tributary of Ganga.

In the next table we have given available list of existing mini and micro hydropower projects in Uttarakhand, based on UREDA information.

Table 1: List of projects up to 1 MW under operation

SN	Project	Ins Cap (MW)	Dist	Basin
1	Milkhet	0.1	Chamoli	Alaknanda
2	Bamiyal	*	Chamoli	Alaknanda
3	Bursol	0.2	Chamoli	Alaknanda
4	Choting	0.1	Chamoli	Alaknanda
5	Ghagara	0.1	Chamoli	Alaknanda
6	Ghagara Extension	*	Chamoli	Alaknanda
7	Ghes	0.1	Chamoli	Alaknanda
8	Gulari	0.2	Chamoli	Alaknanda
9	Niti	0.025	Chamoli	Alaknanda
10	Sarma	0.1	Chamoli	Alaknanda Nandakini/ Maini Gad
11	Wan	0.05	Chamoli	Alaknanda
12	Bank	0.10	Chamoli	Alaknanda Pinder
13	Gamsali Bampa	0.05	Chamoli	Alaknanda Dhauliganga/Ganesh Ganga
14	Kedarnath II	0.2	Rudraprayag	Alaknanda
15	Badiyakot	0.1	Bageshwar	Alaknanda
16	Kunwari	0.05	Bageshwar	Alaknanda
17	Borbalada	0.025	Bageshwar	Alaknanda Pindar/ Chhiyaldi Gad

18	Dokti	0.02	Bageshwar	Alaknanda
19	Dior IInd Phase	*	Pauri	Alaknanda/ Ganga
20	Chandrabhaga Gad	*	Tehri	Bhagirathi
21	Jakhana	0.1	Tehri	Bhagirathi Bhilangana/Balganga
22	Gangotri-I	0.1	UttarKashi	Bhagirathi Kedar Ganga
23	Kanwashram	0.1	Pauri	Ganga
24	Bilkot	0.05	Pauri	Ramganga
25	Dior Ist Phase	0.1	Pauri	Ramganga
26	Gogina II	0.05	Bageshwar	Ramganga
27	Sattshwar	0.05	Bageshwar	Ramganga
28	Toli	*	Bageshwar	Ramganga
29	Ramgarh	0.1	Nainital	Ramganga
30	Lathi	0.1	Bageshwar	E Ramganga/Sharda
31	Liti	0.05	Bageshwar	E Ramganga/Sharda
32	Liti-II	0.05	Bageshwar	E Ramganga/Sharda
33	Ratmoli	0.05	Bageshwar	E Ramganga/Sharda
34	Baghar	0.05	Bageshwar	E Ramganga/Sharda
35	Baicham	0.1	Bageshwar	E Ramganga/Sharda
36	Jugthana	0.1	Bageshwar	E Ramganga/Sharda
37	Kanol gad	0.1	Bageshwar	E Ramganga/Sharda
38	Karmi	0.05	Bageshwar	E Ramganga/Sharda
39	Karmi -III	0.05	Bageshwar	E Ramganga/Sharda
40	Karmi-II	0.05	Bageshwar	E Ramganga/Sharda
41	Bhikuriya Gad	0.5	Pithoragarh	Sharda
42	Kanchauti	*	Pithoragarh	Sharda
43	Lamabager	0.20	Bageshwar	Sharda Saryu
44	Lamchula	0.05	Bageshwar	Sharda Saryu
45	Tarula	0.10	Almora	Sharda Saryu/Jataya Ganga
46	Taluka	0.025	Uttarkashi	Yamuna Tons/ Gattu Gad
47	Bhadri Gad	0.02	Tehri	Yamuna

From <http://ahec.org.in/>, capacity of some of the projects is as per the UJVNL website. The capacity comes to 3.815 MW for the 41 projects for which capacity is available. * means capacity is not known.

Overview of hydropower Projects in Uttarakhand Based on above two tables, in the following table we have provided an overview of operating hydropower projects and their capacity, with basin wise and size wise break up. Uttarakhand has total of 98 existing hydropower projects, with total installed capacity of close to 3600 MW. At least eleven of these projects are in private sector with total capacity of over 503 MW. An additional about 1800 MW capacity is in central sector. It means that majority of the power generation capacity in the state is not owned by the state and there is no guarantee how much of that power would be available to the state.

Table 2: Basin wise number of operating hydro projects in Uttarakhand

Basin	Large Hydro projects (above 25 MW)		Small Hydro projects (1-25 MW)		Mini-micro Hydro projects (below 1 MW)		Total Hydro projects	
	No of projects	Capacity, MW	No of Projects	Capacity, MW	No of Projects	Capacity, MW	No of Projects	Capacity, MW
Alaknanda	1	400	10	54.75	21	2.22	32	456.97
Bhagirathi	4	1794	5	56.7	4	0.4	13	1851.1
Ganga Sub basin	1	144	2	29.7	1	0.1	4	173.8
Ramganga	1	198	2	11.8	9	1.05	12	210.85
Sharda	3	415.6	4	7.7	21	4.45	28	427.75
Yamuna	5	474.75	1	3	3	0.445	9	478.195
TOTAL	15	3426.35	24	163.65	59	8.665	98	3598.665

Here we should note that as per the Union Ministry of New and Renewable Energy sources, in Uttarakhand, by March 2013, 98 small hydro schemes has been installed with total capacity of 170.82 MW. If we add the small and mini-micro projects in above table, we have 83 operating schemes with installed capacity of 172.315 MW. This mis-match is not possible to resolve since MNRE does not provide full list of operating SHPs in Uttarakhand.

Under Construction Hydropower projects in Uttarakhand In the table below we have given available list of under construction hydropower projects in Uttarakhand. Actual list of under construction projects is

likely to be larger than this, since clear and upto-date information is not available on official website. The list does not include the mini and micro hydropower projects that are under construction. Even in case of small hydro projects (1-25 MW capacity), the list is not complete. According to this list, 25 projects with 2376.3 MW capacity are under construction in Uttarakhand. 6 of them are large hydropower projects and rest 19 are small hydro projects. Of the 6 large hydropower projects, three are in private sector and three are in central sector, none in state sector.

Table 3: List of Hydropower Projects under construction

SN	Project	Ins Cap (MW)	Dist	Sub-Basin
1	Srinagar	330	Pauri	Alaknanda
2	Phata- Byung	76	Rudraprayag	Alaknanda
3	Singoli-Bhatwari	99	Rudraprayag	Alaknanda
4	Lata Tapovan	171	Chamoli	Alaknanda
5	Tapovan Vishnugad	520	Chamoli	Alaknanda
6	Madhmaheshwar (ADB)	10	Rudrprayag	Alaknanda
7	Kaliganga-II (ADB)	6	Rudrprayag	Alaknanda
8	Bgyunderganga (P)	24.3	Chamoli	Alaknanda
9	Birahi Ganga-I (P)	24	Chamoli	Alaknanda
10	Devali (P)	13	Chamoli	Alaknanda
11	Kail ganga	5	Chamoli Pinder	Alaknanda
12	Khiraoganga (P)	4	Uttarkashi	Alaknanda
13	Sobla I	8	Pithoragarh	Alaknanda
14	Hafla	0.2	Chamoli	Alaknanda Hafla Gad
15	Nigol Gad	0.1	Chamoli	Alaknanda Nigal Gad
16	Wachham	0.50	Bageshwar	Alaknanda Pindar/SunderDhunga Gad
17	Tehri stage-II	1000	Tehri	Bhagirathi
18	Asiganga-I	4.5	Uttarkashi	Bhagirathi
19	Asiganga-II	4.5	Uttarkashi	Bhagirathi
20	Suwarigad	2	Uttarkashi	Bhagirathi
21	Limchagad	3.5	Uttarkashi	Bhagirathi
22	Kaldigad (ADB)	9	Uttarkashi	Bhagirathi
23	Balganga-II	7	Tehri Garhwal	Bhagirathi
24	Jalandhari Gad (P)	24	Uttarkashi	Bhagirathi
25	Kakora Gad (P)	12.5	Uttarkashi	Bhagirathi
26	Kot-Buda Kedar (P)	6	Tehri	Bhagirathi
27	Siyangad (P)	11.5	Uttarkashi	Bhagirathi
28	Kotijhala	0.2	Tehri	Bhagirathi Bal Ganga
29	Pinsward	0.05	Tehri	Bhagirathi Bal Ganga
30	Dunao	1.5	Pauri	Ganga sub basin
31	Gaudi Chida	0.25	Pauri	Ganga sub basin E Nayar
32	Rotan	0.05	Pithoragarh	Sharda E Ramganga/Rotan
33	Duktu	0.025	Pithoragarh	Sharda Kali/ Nati Yanki
34	Nagling	0.05	Pithoragarh	Sharda Kali/ Nagling Yanki
35	Sela	0.05	Pithoragarh	Sharda Dhauli Ganga/ Seal Gad
36	Kutty	0.05	Pithoragarh	Sharda Kali
37	Napalchu	0.05	Pithoragarh	Sharda Kali/ Piear Yanki
38	Bundi	0.05	Pithoragarh	Sharda Kali/ Pulung Gad
39	Rongkong	0.05	Pithoragarh	Sharda Kali/ Dangiand Yanki
40	Chiludgad	0.10	Uttarakashi	Yamuna Supin/Chilude Gad
41	Khapu Gad	0.04	Uttarakashi	Yamuna Supin/Khapu Gad

Total Under Construction 2378.115 MW

Note: Projects like Loharinag Pala, Pala Maneri, Bhairoghathi and other projects along Bhagirathi upstream of Uttarkashi along the Eco Sensitive zone have been dropped from this list. Rest of the list is from the IMG report or from UJVNL website. P in the bracket indicates the project is in private sector. ADB in the bracket indicates that the project is funded by the Asian Development Bank.

Proposed hydropower projects in Uttarakhand In following tables we have provided available list of proposed hydropower projects in the Alaknanda, Bhagirathi, Yamuna, Sharda and Ramganga basins in Uttarakhand. The list is likely to be longer than the list in these tables since full and upto-date information is not available. Also there are different agencies involved in proposing, sanctioning and executing these projects and there is no one agency who would provide comprehensive picture of what is happening in the basin. However, even this available list is frightening.

Table 4: Proposed Hydropower projects in Alaknanda Basin

SN	Project	Ins Cap (MW)	Dist	Sub-Basin	Status
1	Vishnugad Pipalkoti (WB)	444	Chamoli	Alaknanda	Construction to be started
2	Kotli Bhel (IB)	320	Pauri	Alaknanda	EAC ok/FAC u/consideration
3	Alaknanda (P Badrinath)	300	Chamoli	Alaknanda	EC & FC ok IA not signed
4	Devsari Dam	252	Chamoli	Alaknanda	EC & FC ok CEA concrcnce?
5	Kotli Bhel II	530	Pauri	Ganga sub basin	EAC ok/FAC u/consideration
6	Bowla Nandprayag	300	Chamoli	Alaknanda	EAC TOR Approved
7	Tamak Lata	280	Chamoli	Alaknanda	EC ok, DPR under revision
8	Nand Prayag	100		Alaknanda	DPR returned
9	Jelam Tamak	108	Chamoli	Alaknanda	EAC ok in June 2013
10	Maleri Jelam	55	Chamoli	Alaknanda	PFR prepared
11	Rishiganga I	70	Chamoli	Alaknanda	PFR prepared
12	Rishiganga II	35	Chamoli	Alaknanda	PFR prepared
13	Gohana Tal	60	Chamoli	Alaknanda	PFR prepared
14	Rambara	24	Rudraprayag	Alaknanda	IMG report
15	Birahi Ganga-II (P)	24	Chamoli	Alaknanda	DPR under revision
16	Melkhet (P)	56	Chamoli	Alaknanda Pinder	Proposed
17	Urgam-II	3.8	Chamoli	Alaknanda	Under S&I
18	Bhyunder Ganga	243	Chamoli	Alaknanda	FC under consideration
19	Nand Pyayag Langasu	141	Chamoli	Alaknanda	EAC TOR Approved
20	Rambara	76	Rudraprayag	Alaknanda	EAC TOR u/consideration
21	Bagoli	90	Chamoli	Alaknanda	Proposed
22	Bangri	44	Chamoli	Alaknanda	Pinder
23	Madhya Maheshwar	350	Chamoli	Alaknanda	Proposed
24	Ming Nalgaon	114	Chamoli	Alaknanda	Pinder
25	Padli	66	Chamoli	Alaknanda	Proposed
26	Thapli	44	Chamoli	Alaknanda	Proposed
27	Utyasu-I	70	Chamoli	Alaknanda	Proposed
28	Utyasu-II	205	Chamoli	Alaknanda	Proposed
29	Utyasu-III	195	Chamoli	Alaknanda	Proposed
30	Utyasu-IV	125	Chamoli	Alaknanda	Proposed
31	Utyasu-V	80	Chamoli	Alaknanda	Proposed
32	Utyasu-VI	70	Chamoli	Alaknanda	Proposed
33	Rampur Tilwari	25	Rudraprayag	Alaknanda	Proposed
34	Chunni semi	24	Rudraprayag	Alaknanda	Proposed Mandakini
35	Kosa	24	Chamoli	Alaknanda	Dhauliganga
36	Vijay nagar- Rampur	20	Rudraprayag	Alaknanda	Proposed
37	Nandakini-III	19.5	Chamoli	Alaknanda	Proposed
38	Nayar	17	Pauri	Ganga sub basin	Nayar
39	Alaknanda I	15	Chamoli	Alaknanda	Proposed
40	Buara	14	Bageshwar	Alaknanda	Pindar
41	Duna Giri	10	Chamoli	Alaknanda	Dhauliganga
42	Alaknanda II	10	Chamoli	Alaknanda	Proposed
43	Balkhila-II	10	Chamoli	Alaknanda	Proposed
44	Mandani Ganga	10	Rudraprayag	Alaknanda	Mandakini Mandani ganga
45	Rishiganga	8.25	Chamoli	Alaknanda	Proposed
46	Subhain	8	Chamoli	Alaknanda	Dhauliganga
47	Son	7	Rudraprayag	Alaknanda	Mandakini son gad
48	Kalp ganga	6.25	Chamoli	Alaknanda	Proposed kalpganga
49	Lustar	6	Rudraprayag	Alaknanda	Mandakini Lustar
50	Madhya maheshwar -II	6	Rudraprayag	Alaknanda	Mandakini madmaheshwar
51	Hom 6	6	Chamoli	Alaknanda	Dhauliganga
52	Amrit ganga	6	Chamoli	Alaknanda	Amrit ganga balsuti gadera
53	Gaddi	5.25	Chamoli	Alaknanda	dhauliganga Gaddi Gadera
54	Deval	5	Chamoli	Alaknanda	Proposed
55	Ghrit Ganga	5	Chamoli	Alaknanda	Proposed
56	Jumma	5	Chamoli	Alaknanda	Proposed
57	Ringi	5.5	Chamoli	Alaknanda	Dhauliganga
58	Tamak	5	Chamoli	Alaknanda	Proposed
59	Balkhila-I	5.5	Chamoli	Alaknanda	Proposed Balkhila
60	Basti -I	4	Rudraprayag	Alaknanda	Proposed
61	Basti -II	4	Rudraprayag	Alaknanda	Proposed
62	Laxmanganga	4	Chamoli	Alaknanda	Proposed
63	Nil ganga	3	Chamoli	Alaknanda	Proposed
64	Santodhar - I	2	Pauri	Ganga sub basin	W Nayar

65	Santodhar – II	2	Pauri	Ganga sub basin	W Nayar
66	Birahiganga	4.8	Chamoli	Alaknanda	Proposed
67	Byaligaon	2.25	Pauri	Ganga sub basin	E Nayar
68	Ghirit Ganga	1.3	Chamoli	Alaknanda	Proposed
69	Jummagad	1.2	Chamoli	Alaknanda	Proposed
70	Kailganga	3	Chamoli	Alaknanda	Proposed
71	Kakra	1	Rudraprayag	Alaknanda	Proposed
72	Kali Ganga	3	Chamoli	Alaknanda	Proposed
73	Garud Ganga	0.6	Chamoli	Alaknanda	Proposed
74	Gansali Bampa	0.05	Chamoli	Alaknanda	Dhauliganga/Ganesh Ganga
Alaknanda Total		5199.25			

Table 5: Proposed Hydropower projects in Bhagirathi Basin

SN	Project	Ins Cap (MW)	Dist	Sub-Basin	Status
1	Kotli Bhel (IA)	195	Pauri	Bhagirathi	EC/FAC stage 1
2	Jhalakoti (P)	12.5	Uttarkashi	Bhagirathi	Proposed dharamganga
3	Bhilangana II A	24	Uttarkashi	Bhagirathi	Proposed
4	Karmali	140	Uttarkashi	Bhagirathi	IMG, on Eco-sensitive zone?
5	Jadhganga	50	Uttarkashi	Bhagirathi	IMG: PFR prepared
6	Bhilangana IIB	24	Tehri	Bhagirathi	Under S&I
7	Bhilangana IIC	24	Tehri	Bhagirathi	Under S&I
8	Pilangad-II	4	Uttarkashi	Bhagirathi	Proposed
9	Bhela Tipri	100	Uttarakashi	Bhagirathi	Proposed
10	Nelong	190	Uttarakashi	Bhagirathi	Proposed
11	Asiganga-III	9	Uttarkashi	Bhagirathi	Proposed
12	Gangani (P)	8	Uttarkashi	Bhagirathi	Proposed
13	Balganga-I	5	Tehri Garhwal	Bhagirathi	Proposed
14	Khiraoganga	4	Uttarkashi	Bhagirathi	Proposed
15	Lagrasu (P)	3	Tehri Garhwal	Bhagirathi	Proposed
16	Songad	3	Uttarkashi	Bhagirathi	Proposed
17	Jalandhari Gad	3	Uttarakashi	Bhagirathi	Proposed
18	Jalkurgad I	2	Tehri Garhwal	Bhagirathi	Proposed Jalkur gad
19	Rataldhara	0.4	Tehri Garhwal	Bhagirathi	Proposed Jalkur Gad
20	Lamb Gaon	0.4	Tehri Garhwal	Bhagirathi	Proposed Jalkur gad
21	Dhatirmouli	0.4	Tehri Garhwal	Bhagirathi	Proposed Jalkurgad
22	Gangi-Richa	0.2	Tehri	Bhagirathi	Bhilangana/ Re Gad
Bhagirathi Total		801.9			

Table 6: Proposed Hydropower projects in West Ramganga Basin

SN	Project	Ins Cap (MW)	Dist	Sub-Basin	Status
1	Babas Dam	88	Almora	Ramganga	Proposed
2	Khati	63	Bageshwar	Ramganga	Proposed
3	Lumi	54	Bageshwar	Ramganga	Proposed
4	Kuwargarh	45	Bageshwar	Ramganga	Proposed
5	Bawas Gaon	34	Nainital	Ramganga	Proposed
6	Jamrani Dam	30		Ramganga	Proposed
7	Khutani	18	Bageshwar	Ramganga	Proposed
8	Sarju Stage-II (P)	15	Bageshwar	Ramganga	Proposed
9	Sarju Stage-III (P)	10.5	Bageshwar	Ramganga	Proposed
10	Sheraghat	10	Almora	Ramganga	Kho
11	Baura	14	Bageshwar	Ramganga	Proposed
12	Sarju Stage-I (P)	7.5	Bageshwar	Ramganga	Proposed
13	Balighat	5.5	Bageshwar	Ramganga	Proposed
14	MehalChaura-I	4	Pithoragarh	Ramganga	Proposed
15	MehalChaura-II	3	Pithoragarh	Ramganga	Proposed
16	Agarchatti	2	Pithoragarh	Ramganga	Proposed
17	Kho I	2	Pauri	Ramganga	Kho
18	Kho II	2	Pauri	Ramganga	Proposed
19	Harsila	0.7	Bageshwar	Ramganga	Proposed harsila gad
20	Kalsa	0.3	Nainital	Ramganga	Proposed
Ramganga Total		408.5			

Table 7: Proposed Hydropower projects in Sharda Basin

SN	Project	Ins Cap (MW)	Dist	Sub-Basin	Status
1	Mapang Bogudhiyar (P)	200	Pithoragarh	Sharda	EAC TOR Approved
2	Bogudhiyar Sarkaribhyol (P)	170	Pithoragarh	Sharda	EAC TOR Approved

3	Sarkaribhyol Rupsiabagar	210	Pithoragarh	Sharda	EAC TOR Approved
4	Rupsiabagar Khasiabara	260	Pithoragarh	Sharda	EAC Ok / FAC Rejected
5	Bokang Baling	330	Pithoragarh	Sharda	Proposed THDC
6	Chungar Chal	240	Pithoragarh	Sharda	Proposed NHPC
7	East Ram Ganga Dam	30	Pithoragarh	Sharda	Proposed
8	Khartoli Lumti Talli	55	Pithoragarh	Sharda	Proposed
9	Budhi	192	Pithoragarh	Sharda	Mahakali
10	Garba Tawaghat	610	Pithoragarh	Sharda-Mahakali	Proposed NHPC
11	Garbyang	131	Pithoragarh	Sharda	Mahakali
12	Lakhanpur	160	Pithoragarh	Sharda	Proposed
13	Malipa	138	Pithoragarh	Sharda	Mahakali
14	Pancheshwar	6000	Pithoragarh	Sharda	Indo Nepal Project
15	Purnagiri Dam	1000	Champawat	Sharda	Indo Nepal Project
16	Tawaghat - Tapovan	105	Pithoragarh	Sharda	Mahakali
17	Taopvan Kalika	160	Pithoragarh	Sharda	Mahakali
18	Tapovan Chunar	485	Pithoragarh	Sharda	Proposed
19	Sela Urthing	230	Pithoragarh	Sharda	Proposed
20	Urthing Sobla (P)	340	Pithoragarh	Sharda	Proposed
21	Sobla Jhimjingao	145	Pithoragarh	Sharda	Proposed
22	Kalika - Baluwakot	120	Pithoragarh	Sharda	Mahakali
23	Kalika Dantu	230	Pithoragarh	Sharda	Proposed
24	Dhauliganga Intermediate	200	Pithoragarh	Sharda	Proposed NHPC
25	Gauriganga III A & B	140	Pithoragarh	Sharda	Proposed NHPC
26	Madkini (P)	39	Pithoragarh	Sharda	Proposed
27	Burthing - Purdam	5	Pithoragarh	Sharda	Proposed Jakula
28	Jimbagad	7.7	Pithoragarh	Sharda	Proposed
29	Suringad-II	5	Pithoragarh	Sharda	Proposed
30	Tanga (P)	5	Pithoragarh	Sharda	Proposed
31	Tankul	12	Pithoragarh	Sharda	Proposed
32	Motighat (P)	5	Pithoragarh	Sharda	Proposed
33	Painagad	9	Pithoragarh	Sharda	Proposed
34	PhuliBagar- Kwiti	4	Pithoragarh	Sharda	Proposed Jakula
35	Kumeria- Garjia (Bawas)	12.5	Nainital	Sharda	Kosi
36	Balgad	8	Pithoragarh	Sharda	E Ramganga
37	Kuti SHP	6	Pithoragarh	Sharda	Maha Kali/ Kuti yangti
38	Palang SHP	6.5	Pithoragarh	Sharda	Maha Kali/ Plang gad
39	Najyang SHP	5.5	Pithoragarh	Sharda	Maha Kali/ Najyang gad
40	Simkhola SHP	8.75	Pithoragarh	Sharda	Maha Kali/ Simkhola gad
41	Birthe	1	Pithoragarh	Sharda	Balchinn
42	Baram	1	Pithoragarh	Sharda	Dhauli Ganga/ Baram Gad
43	Unchiya	0.05	Pithoragarh	Sharda	Dhauli Ganga/ Khari Gad
44	Murtoli	0.02	Pithoragarh	Sharda	Goriganga/ Martoligad
45	Burphu	0.03	Pithoragarh	Sharda	Goriganga/ Martoligad
46	Ralam	0.03	Pithoragarh	Sharda	Goriganga/ Ralangad
47	Ram Gad-II	0.1	Nainital	Sharda	Kosi/ Ramgad
48	Watcm	0.1	Pithoragarh	Sharda	Ramgad E/ Watchraila
Total Sharda Basin		12022.28			

Table 8: Proposed Hydropower projects in Yamuna Basin

SN	Project	Ins Cap (MW)	Dist	Sub-Basin	Status
1	Lakhwar	300	Dehradun	Yamuna	EAC TOR Approved
2	Vyasi	120	Dehradun	Yamuna	EAC Recommended
3	Arakot Tuni	81	Uttarkashi	Yamuna	EAC TOR Approved
4	Tuni Plasu	66	Dehradun	Yamuna	EAC TOR Approved
5	Mori-Hanol (P)	63	Uttarkashi	Yamuna	EAC TOR Approved
6	Naitwar Mori (Dewari Mori)	60	Uttarkashi	Yamuna	EAC Recommended
7	Hanol Tuni (P)	60	Uttarkashi	Yamuna	EAC Recommended
8	Jakhola Sankri	45	Uttarkashi	Yamuna	EAC TOR Approved
9	Kishau	600	Dehradun	Yamuna	Proposed
10	Chammi Naingaon	540	Uttarakashi	Yamuna	Proposed
11	Chatra Dam	300	Uttarakashi	Yamuna	Proposed
12	Taluka Sankri	140	Uttarkashi	Yamuna	Proposed
13	Taluka Dam	112	Uttarakashi	Yamuna	Proposed
14	Sankri Mori	78	Uttarakashi	Yamuna	Proposed
15	Barkot Kuwa	42	Uttarakashi	Yamuna	Proposed
16	Hanuman Chatti Sianachatti	33	Uttarakashi	Yamuna	Proposed

17	Barnigad Naingaon	30	Uttarakashi	Yamuna	Proposed
18	Rupin Stage V (P)	24	Uttarkashi	Yamuna	Proposed
19	Damta - Naingaon	20	Uttarkashi	Yamuna	Proposed
20	Tons	14.4	Uttarkashi	Yamuna	Proposed
21	Supin	11.2	Uttarkashi	Yamuna	Proposed
22	Rupin Stage IV (P)	10	Uttarkashi	Yamuna	Proposed
23	Rupin Stage III (P)	8	Uttarkashi	Yamuna	Proposed
24	Barnigad	6.5	Uttarakashi	Bhagirathi	Proposed
25	Pabar	5.2	Dehradun	Yamuna	Proposed
26	Badyar (P)	3	Uttarkashi	Yamuna	Proposed
27	Lagrasu	3	Tehri	Yamuna	Proposed
28	Rayat (P)	3	Tehri	Yamuna	Proposed
29	Ringali	1	Tehri Garhwal	Yamuna	Proposed Aglar Ringaligad
30	Purkul	1	Dehradun	Yamuna	Tons
31	Paligad	0.3	Uttarkashi	Yamuna	Proposed Paligad
32	Rikhani Gad	0.05	Uttarkashi	Yamuna	Rikhanigad
33	Bijapur	0.2	Dehradun	Yamuna	Tons
Yamuna Total		2780.85 MW			
Grand Total		21212.78 MW			

Note: EAC: Expert Appraisal Committee of MoEF; FAC: Forest Advisory Committee of MoEF; EC: Environment Clearance; FC: Forest Clearance; TOR: Terms of Reference (of EIA); for Alaknanda, the first 17 projects are listed as given in IMG report and for Bhagirathi first 8 projects are as listed in IMG report. However, many of these projects have been recommended to be dropped by the WII (Wildlife Institute of India) report. Also, IMG and others have said that no other projects should be taken up in Bhagirathi and Alaknanda basins. The projects listed above in the Bhagirathi basin beyond serial number 8 and those in Alaknanda basin beyond 17 would in any case not be taken up.

Overview of Hydropower Projects In the table 10 we have provided an overview of proposed hydropower projects in Uttarakhand based on the information from above five tables.

Table 9 Overview of Proposed Hydropower Projects in Uttarakhand

Basin	Large Hydro projects (above 25 MW)		Small Hydro projects (1-25 MW)		Mini-micro Hydro projects (below 1 MW)		Total Hydro projects	
	No of projects	Capacity, MW	No of Projects	Capacity, MW	No of Projects	Capacity, MW	No of Projects	Capacity, MW
Alaknanda	29	4823	43	375.6	2	0.65	74	5199.25
Bhagirathi	5	675	13	125.5	4	1.4	22	801.9
Ramganga	6	314	12	93.5	2	1	20	408.5
Sharda	26	11920	16	101.95	6	0.33	48	12022.28
Yamuna	17	2670	13	110.3	3	0.55	33	2780.85
TOTAL	83	20402	97	806.85	17	3.93	197	21212.78

Overview of hydropower projects in Uttarakhand In the table 11 we have given basin-wise figures of total large, small and mini-micro hydropower projects (including existing, under construction and proposed) projects in Uttarakhand. According to Union Ministry of New and Renewable energy, total potential of small hydro in Uttarakhand is 1707.87 MW from 448 small hydro projects. If we take that into account the figures in the following tables would change (go up) accordingly.

Table 10: Basin wise total capacities for large, small and mini HEPs in Uttarakhand

Basin	Large Hydro projects (above 25 MW)		Small Hydro projects (1-25 MW)		Mini-micro hydro projects (<1 MW)		Total Hydro projects	
	No of projects	Capacity, MW	No of Projects	Capacity, MW	No of Projects	Capacity, MW	No of Projects	Capacity, MW
Alaknanda	35	6419	61	524.65	26	3.67	122	6947.32
Bhagirathi	10	3469	28	266.7	10	2.05	48	3737.75
Ganga Sub basin	1	144	3	31.2	2	0.35	6	175.55
Ramganga	7	512	14	105.3	11	2.05	32	619.35
Sharda	29	12335.6	20	109.65	35	5.155	84	12450.405
Yamuna	22	3144.75	14	113.3	8	1.135	44	3259.185
TOTAL	104	26024.35	140	1150.8	92	14.41	336	27189.56

In the table 12 we have put together the number and capacities of existing, under construction and proposed hydropower projects in various basins of Uttarakhand. Uttarakhand government has plans to have total of 336 hydropower projects with total capacity of 27189.56 MW. Largest number (122) of such projects are in Alaknanda basin, the largest capacity is proposed to be in Sharda basin at 12450.405 MW.

Table 11: Overview of all Hydropower projects in Uttarakhand

Basin	Existing Hydro projects		Under construction		Proposed HEPs		Total Hydro projects	
	No of projects	Capacity, MW	No of Projects	Capacity, MW	No of Projects	Capacity, MW	No of Projects	Capacity, MW
Alaknanda	32	456.97	16	1291.1	74	5199.25	122	6947.32
Bhagirathi	13	1851.5	13	1084.75	22	801.9	48	3737.75
Ganga Sub basin	4	173.8	2	1.75	-	-	6	175.55
Ramganga	12	210.8	-	-	20	408.5	32	619.35
Sharda	28	427.75	8	0.375	48	12022.28	84	12450.405
Yamuna	9	478.195	2	0.14	33	2780.85	44	3259.185
TOTAL	98	3598.665	41	2378.115	197	21212.78	336	27189.56

Basin Maps Maps of Hydroelectric Projects in various sub basins of Uttarakhand are available at the following links. Please note that the maps are based on information available when the maps were created in 2011:

http://sandrp.in/basin_maps/Hydropower_Projects_in_Ganga_Basin.pdf, http://sandrp.in/basin_maps/Bhagirathi%20150411.jpg
http://sandrp.in/basin_maps/Alaknanda%20150411.jpg, http://sandrp.in/basin_maps/Mandakini150411.jpg
http://sandrp.in/basin_maps/Goriganga150411.jpg, http://sandrp.in/basin_maps/Major_Hydro_Projects_in_Yamuna_Basin.pdf

How do the hydropower projects increase the disaster proportions? This is a question that a lot of

Almost all hydropower projects of Uttarakhand involve deforestation. Deforestation directly increases the potential of erosion, landslides and floods since water now just runs off to the rivers, soil becomes exposed and without any binding that forests provided.

journalists, TV anchors and other have been asking since the Uttarakhand disaster. Here is a quick response to that question:

⇒ Almost all hydropower projects of Uttarakhand involve deforestation. Deforestation directly increases the potential of erosion, landslides and floods since water now just runs off to the rivers, soil becomes exposed and without any binding that forests provided. Moreover the compensatory

afforestation and catchment area treatment, even when done, usually involves planting of commercially important variety of trees like pine and teak and not broad leaf trees like oaks that not only adds to humus in the soil, but also allow rich under growth. Pine does not allow this to happen. This change in character of forests is something Gandhiji's disciple Mira Behen has been warning since independence, but there is little impact of this on the forest department.

⇒ The largest amount of deforestation in Uttarakhand has happened basically for HEPs.

⇒ All the run of the river projects involve building of a dam, diversion structure, desilting mechanism, tunnels that could have length of 5 to 30 km and width sufficient to carry three trains side by side, as also roads, townships, mining, among other components. All of these components increase the disaster potential of the area in one or the other way. Cumulative impacts of all the components of any projects and all the projects in a given basin is likely to be larger than the addition of the impacts of individual projects in many cases.

⇒ Blasting of massive proportions is involved in construction of all these components, which add to the landslide risks. In fact Uttarakhand's Disaster Mitigation and Management Centre in their report of Oct 2012 after the Okhmath disaster of Sept 2012 recommended that no blasting should be allowed for any development activity anywhere in Uttarakhand, but Uttarakhand government did nothing about this recommendation.

⇒ The massive tunneling by itself weakens the young and fragile Himalayan mountains, increasing the disaster potential.

⇒ Each of the hydropower projects generate massive amount of muck in tunneling, blasting and other activities, a large hydropower project could easily generate millions of cubic meters of muck. The large projects are supposed to have muck disposal plan, with land acquired for muck disposal, transportation of muck to the designated sites above the High Flood levels, creation of safety walls and stabilization process. But all this involves costs. The project developers and their contractors find it easier to dump this muck straight into the nearby rivers. In the current floods, this illegally dumped muck created massive disaster in downstream areas in case of 330 MW Srinagar HEP, the 76 MW Phata Byung HEP and the 99 MW Singoli Bhatwari HEP. When the flooded rivers carry this muck, boulders and other debris, has much greater erosion capacity and also leaves behind massive heaps of this muck in the flooded area. In

Srinagar town about 100 houses are buried in 10-30 feet depth of muck. Such debris laden rivers also create massive landslides along the banks.

⇒ Wrong operation of hydropower projects can also create greater disasters in the downstream areas. For example the operators of 400 MW Vishnuprayag HEP on Alaknanda river did not open the gates

Blasting of massive proportions is involved in construction of all these components, which add to the landslide risks. In fact Uttarakhand's Disaster Mitigation and Management Centre in their report of Oct 2012 after the Okhimath disaster of Sept 2012 recommended that no blasting should be allowed for any development activity anywhere in Uttarakhand, but Uttarakhand government did nothing about this recommendation.

when the river was flooded on June 16-17, possibly to maximize power generation. However, this led to accumulation of massive quantities of boulders (for photos of dam filled with such boulders see: <http://matuganga.blogspot.in/>) behind the dam, so much so that there was no space for water to flow. The river then bypassed the dam and started flowing by the side of the dam, creating a new path for its flow. This created a sudden flashflood situation in the downstream area, creating new disaster there.

⇒ The incomplete, broken and ill designed protection wall of the Maneri Bhali projects in Uttarkashi lead to erosion and landslides in the downstream areas.

Damaged Hydro Projects A large number of hydropower projects are likely to have suffered damage due to the flood disaster in Uttarakhand. Some of the projects that have suffered damage include:

- According to the update from <http://www.energylineindia.com/> on June 27, 2013, the **520 MW under construction Tapovan Vishnugad HEP** has suffered damaged by rains on June 16, 2013: "While construction of diversion tunnel was completed in April this year, the same was washed away due to heavy rains on June 16. Diversion dyke has washed away and damages have been observed in chormi adit approach road. In August last year, the flash floods had caused serious damages in the coffer dam of the project."
- **400 MW Vishnuprayag HEP of JP Associates has suffered serious, but as yet unassessed damage** (<http://www.indianexpress.com/news/jaiprakash-power-tanks-15-as-plant-shuts-down-in-uttarakhand/1133083/>). As per MATU PR (<http://matuganga.blogspot.in/>), the project has also been cause of damage in Lambagad village, which was also flashed on front page of TOI on June 25, 2013, though without mentioning the project. The blog also provides the before and after pictures of the upstream and downstream of the project.
- **76 MW Phata Byung HEP of Lanco in Mandakini Valley in Uttarakhand**
- **99 MW Singoli Bhatwari HEP of L&T in Mandakini Valley in Uttarakhand** NDTV India reported that the water level of the river has gone up due to the silt dumped by dams. This is likely to be due to the Phata Byung and Singholi Bhatwari HEPs.
- **Kali Ganga I, Kali Ganga II and Madhyamaheshwar HEP, all in Mandakini Valley, all of UJVNL, all hit by mudslides** (<http://www.indianexpress.com/news/uttarakhands-r500-crore-request-to-prevent-landslides-pending-since-2009/1132351/>)
- **Assiganga projects on Assiganga river in Bhagirathi basin in Uttarakhand**
- **5 MW Motighat I HEP in Goriganga basin in Pithoragarh** (Himalprakriti report)
- **280 Dhauliganga Project of NHPC in Pithoragarh district of Uttarakhand** (reports said the power house was submerged, but is now working, part of the township was submerged.)
- The Himalaya Hydro (HH) Tanga Phase I for 5 MW, located along the Paina gad in Goriganga basin, is badly damaged. The dam has got smashed by a deluge of huge boulders. One sluice gate is torn through. The metal filter-gates are all choked with boulder debris, and the remnant concrete and gate pulleys of the dam are now stranded mid-river, with both banks eroded and the river now running along the true-left bank. (Himalprakriti report)

- The UREDA 500 KW Motigad microhydel on Moti gadh (a tributary of Paina gadh) at Bindi (Dani Bagad) is also badly damaged. The water has broken through the wall, cut under the foundation, inundated the turbines with water and debris, and smashed the housing for the electrical distribution system. (Himalprakriti report)

Each of the hydropower projects generates massive amount of muck. A large hydropower project could generate millions of cubic meters of muck. The projects are supposed to have muck disposal plan, with land acquired for muck disposal, transportation of muck to the designated sites above the High Flood levels, creation of safety walls and stabilization process. But the project developers find it easier to dump this muck into the rivers. In the current floods, this illegally dumped muck created massive disaster in downstream areas.

The water has broken through the wall, cut under the foundation, inundated the turbines with water and debris, and smashed the housing for the electrical distribution system. (Himalprakriti report)

- The 5.5' diameter head race waterpipes taking water to the HH Phase II, located on the Gori opposite Seraghat, has also been damaged. The generator and housing for the HH Ph II has collapsed into the river. All this damage is said to have happened on the evening of 17th June. People working as non-skilled labour have been sent home for a few months, but welding work on the new pipes feeding the powerhouse is still underway! (Himalprakriti report)

It has been now reported (http://www.business-standard.com/article/companies/gvk-l-t-hydel-projects-hit-by-floods-113062300394_1.html) that the 330 MW Srinagar project, a cause for downstream destruction, has itself suffered massive damages on June 17, 2013, with breach of its protective embankment. The report also mentions the damage to the L&T's Singoli Bhatwari HEP on Mandakini river.

Down to Earth (<http://www.downtoearth.org.in/content/hydropower-projects-suffer-severe-damage>) has given some details of damage to some of the HEPs, quoting UJVNL sources. It says: 19 small hydropower projects have been completely destroyed, while others have been damaged (see table below).

Table 12: Estimated losses to hydel Projects in Uttarakhand

Project	Location	Capacity, MW	Estimated loss
Dhauli Ganga	Pithoragarh	280	30 Cr (power house submerged)
Kaliganga I	Rudraprayag	4	1819 (Power house and 4 houses washed away)
Kaliganga II	Rudraprayag	6	Rs 16 Cr (Power house and 4 houses washed away)
Sobla	Pithoragarh	8	Rs 14 Cr (completely washed away)
Kanchauti	Pithoragarh	1.5	Rs 20 Cr (part of the project washed away)
Chirkila	Pithoragarh	1.5	Rs 20 Cr (part of the project washed away)
Manneri Bhali I & II	Uttarkashi	304 + 90	Rs 2 + 5 cr (walls collapsed, silt in barrages)

In addition, a large number of projects had to stop generation temporarily due to high silt content, including Maneri Bhali I and II, Tanakpur, Dhauli Ganga, Kali Ganga I, some of the Yamuna basin projects among others.

Wrong operation of projects can also create greater disasters in the downstream areas. The operators of 400 MW Vishnuprayag HEP on Alaknanda river did not open the gates when the river was flooded on June 16-17, possibly to maximize power generation. However, this led to accumulation of massive quantities of boulders behind the dam. The river then bypassed the dam and created a new path. This created a sudden flashflood situation in the downstream area, creating new disaster there.

Conclusion This article was intended to give an overview of hydropower projects in Uttarakhand. However, we should add that there are many glaring issues related to these hydropower projects, some of the key issues on environment governance include the following.

Most of these projects are out of the environmental governance. Projects below 25 MW do not require EIA, Social Impact Assessment, public consultation, environmental clearance, environmental management plan or monitoring. This is clearly wrong as all projects have environmental impacts, and they are particularly serious in Himalayan region with multiple vulnerabilities. We have for years demanding that all projects above 1 MW

should need environment clearance, EIA and so on.

- Even for projects above 25 MW we do not have any credible environmental or social impact assessment. Former Environment Minister Jairam Ramesh is on record having accepted that most EIAs are dishonest cut and paste jobs. We do not have any credible process in place to ensure that EIAs are proper and those that are not are rejected and consultants are black listed. Jairam Ramesh did put in place a process of registration of EIA consultants under the Quality Council of India, but that is completely non transparent, unaccountable and ineffective process. It is amazing that reputed NGOs like the Centre for Science and Environment are on board of this process, but they have completely failed to achieve any change and have chosen to remain quite.
- The Environment clearances of the River Valley Projects (which includes hydro projects and dams) is considered by the Expert Appraisal Committee on River Valley Projects appointed by Union Ministry of Environment and Forests. However, the ministry chooses members of the EAC such that they rarely object to any project. As per SANDRP analysis in six years ending in Dec 2012, the EAC had not said NO to any project for environment clearance. Its appraisal of projects, EIAs, public consultation process and its own minutes were found to be inconsistent, unscientific and loaded in favour of the project developers.
- Our environment compliance system is non-existing. The projects are supposed to implement the environment management plan *pari passu* with the project work, they are supposed to follow the conditions of environment clearance, follow the environmental norms, but who is there to ensure this actually happens? The Union Ministry of Environment and Forests which is supposed to ensure this compliance has no capacity the officials tell us. The officials do not have time to even check if six monthly compliance reports are being submitted or make any surprise visits. However they do not even seem to have will, since we have seen no change in this situation for decades. Nor do they seem to have willingness, since even when NGOs present photographic and video and other evidence of violations they refuse to take action.
- One way to achieve compliance is to have a project monitoring committee for each project where over 50% of the members are from local communities and other independent persons and such committees ok must be required each stage for the project to go ahead. We have been suggesting this for long, but the MoEF has shown no willingness to follow this.
- More pertinently, none of the assessment reports look at the impact of the projects from their impacts on the disaster potential of the area. Each of these projects have significant impact on the disaster potential of the area, particularly in the context of vulnerable state like Uttarakhand. This should be a must for all such projects.
- Similarly the projects must also be seen through the climate change lenses, again in vulnerable area like the Himalayas. How the project will impact the local climate, how it will have impact on adoption capacity of the local communities and also how the project itself will be impacted in changing climate. This again we have been writing to the MoEF numerous times, but without any success so far.
- Most significantly, the only impact assessments that we have is for specific projects of over 25 MW capacity. However, we have no credible cumulative impact assessment for any of the river basins of Uttarakhand, which also takes into account carrying capacity of the river basins and all the interventions that are happening in the basins. As our critique of so called cumulative impact assessment of Bhagirathi-Alaknanda basins done by AHEC of IIT Roorkee shows

In response to my question on a programme on *Headlinestoday* channel anchored by Rahul Kanwal on July 8, 2013 (in presence of panel that also included Dr Vandana Shiva and Vimlendu Jha), the Uttarakhand Chief Minister Shri Vijay Bahuguna agreed that he will institute an enquiry into the damage due to the hydropower projects and hold them accountable for such damage. Let us see how soon and how independent and credible enquiry he institutes.

(http://www.sandrp.in/hydropower/Pathetic_Cumulative_Impact_Assessment_of_Ganga_Hydro_projects.pdf), it was not much of a cumulative impact assessment. WII (Wildlife Institute of India, Dehradun) report was somewhat better within the mandate given to it (assessment of hydro projects on aquatic and terrestrial biodiversity), but the most important recommendation of the WII report that at least 24 projects should be dropped has not been accepted by the MoEF, so what is the use of the cumulative impact assessment in such a situation?

Unless we address all of the above issues in a credible way, there is little wisdom in going ahead with more hydropower projects in Uttarakhand. They offer other options for development. Firstly Uttarakhand

will invite greater disaster. Uttarakhand has many

people should get first right over all the power that is getting generated within Uttarakhand. Secondly, this is not a plea for no projects, but to address the crucial issues without addressing which we are in no situation to even know the impacts or address the issues. Thirdly, Uttarakhand needs to take up power generation options that do not accentuate the disaster potential of the area. Such options include micro hydro, hydro kinetics, and solar and biomass based power in addition to better utilization of existing infrastructure.

Unfortunately, going ahead with more hydropower projects in current situation would be invitation to greater disasters. In fact, the Uttarakhand government should not allow even the damaged and under construction hydropower projects until all the conditions mentioned above are satisfied.

Some of the hydropower projects that have surely seems to have added to the disaster proportions of current Uttarakhand flood disaster include the 400 MW Vishnuprayag HEP, the 280 MW Dhauliganga HEP, the 330 MW Shrinagar HEP, the 304 and 90 MW Maneribhali II and I HEPs, the 99 MW Singoli Bhatwari HEP and the 76 MW Phata Byung HEP, the last two on Mandakini river. In response to my question on a programme on *Headlinestoday* channel anchored by Rahul Kanwal on July 8, 2013 (in presence of panel that also included Dr Vandana Shiva and Vimlendu Jha), the Uttarakhand Chief Minister Shri Vijay Bahuguna agreed that he will institute an enquiry into the damage due to these hydropower projects and hold them accountable for such damage. Let us see how soon and how independent and credible enquiry he institutes.

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References:

1. <http://envfor.nic.in>
2. http://www.uttarakhandjalvidyut.com/eoi/list_of_projects_self.pdf and many other UJVNL documents.
3. <http://www.ahec.org.in/shp%20sites/uttarakhand/Hydropower%20stations%20in%20operation%20and%20under%20construction%20in%20uttarakhand.pdf>
4. <http://cleanhydropower.blogspot.in/2009/07/brief-description-of-small-hydro-power.html>
5. <http://ureda.ujvnl.gov.in/pages/show/130-micro-hydro-programme> and other sites of UREDA.
6. http://sandrp.in/env_governance/TOR_and_EC_Clearance_status_all_India_Overview_Feb2013.pdf
7. http://sandrp.in/IMG_report_on_Ganga_has_Pro_Hydro_Bias_June2013.pdf
8. http://www.sandrp.in/hydropower/Pathetic_Cumulative_Impact_Assessment_of_Ganga_Hydro_projects.pdf
9. 2012-13 Annual report of Ministry of New and Renewable Energy: <http://mnre.gov.in/file-manager/annual-report/2012-2013/EN/chapter3.html>

SANDRP's blogs on Uttarakhand disaster :

1. <http://sandrp.wordpress.com/2013/06/21/uttarakhand-deluge-how-human-actions-and-neglect-converted-a-natural-phenomenon-into-a-massive-disaster/>
2. <http://sandrp.wordpress.com/2013/06/23/uttarakhand-floods-disaster-lessons-for-himalayan-states/>
3. <http://sandrp.wordpress.com/2013/06/25/uttarakhand-and-climate-change-how-long-can-we-ignore-this-in-himalayas/>
4. <http://sandrp.wordpress.com/2013/06/25/central-water-commissions-flood-forecasting-pathetic-performance-in-uttarakhand-disaster/>
5. <http://sandrp.wordpress.com/2013/06/28/uttarakhand-floods-truth-about-thdc-and-central-water-commissions-claims-about-tehri/>
6. <http://sandrp.wordpress.com/2013/06/29/lessons-from-uttarakhand-disaster-for-selection-of-river-valley-projects-expert-committee/>
7. <http://sandrp.wordpress.com/2013/06/25/climate-justice-statement-on-the-uttarakhand-catastrophe/>