

WII's Cumulative Impact Assessment of Ganga hydel projects on biodiversity: *A small step in the right direction, but still a long way to go*

If you want to visit Valley of Flowers National Park or the Nandadevi Biosphere reserve in Uttarakhand, plan it this August. If you want to see the Alaknanda and Mandakini Rivers en-route to Kedarnath and Badrinath, do it soon, the rivers may disappear. If you enjoy or worship the sight of the confluence of rivers (called holy prayags, one of which, the Vishnuprayag already stands destroyed), you should rush your plans as they all are slated for extinction. When dams and big hydro projects planned in this region, which are being sanctioned by Ministry of Environment and Forests (MoEF) (and some are already under construction) come up there will be little reason to visit these places in the coming years, unless you like looking at dry rivers and muck disposal sites.

Wildlife Institute of India's (WII) Report on Cumulative Impact Assessment of Hydropower project on terrestrial and aquatic ecology Alaknanda Bhagirathi basins was finally up on the MoEF website on 16th April 2012, more than three months after it was submitted, but just a day before the NGRBA (National Ganga River Basin Authority) meeting. The timing is very significant. While the MoEF can claim the credit for putting this study up before the meeting, none of the members, and very few external experts and media could read the report, support it, or raise and record their concerns before the NGRBA meeting.

More than 70 hydel projects are in various stages¹ of completion, construction and planning in Alaknanda Bhagirathi basins, though there are accounts which say the list could have 300 projects. If all these projects with a combined installed capacity of at least 9563 MW are constructed, they will lead to deforestation of at least 9494.68 ha of forest land and adversely affect 655 kilometres of river length. Many of these projects are entirely or partially inside Gangotri National Park, Kedarnath Wildlife Sanctuary, Nandadevi wildlife Sanctuary, Valley of Flowers National Park (both UNESCO World Heritage sites of Outstanding Universal Values). They will threaten 16 globally threatened fish species, 5 rare and endangered mammals (including Snow Leopard, Brown Bear, Mouse Deer), 5 rare and endangered bird species, and 55 rare and endangered plant species, over 300 medicinal plants and hundreds of plants which are used by locals in varied ways. These are among the known damages, there are likely to be other unknown collateral damages.

Though remarkably high number of projects were under consideration on Alaknanda and Bhagirathi river basins, which would affect culturally and ecologically important rivers, the Panch Prayags, and outstanding universal biodiversity, MoEF did not *suo motto* order for cumulative impact assessment studies. This was done only because CEC and Supreme Court gave explicit directions to the Forest Advisory Committee in Feb 2009 to conduct cumulative impact assessment studies for these projects.

In June 2010, the Forest Conservation Division of the MoEF assigned this study to WII. The NRCDC (National River Conservation Directorate) assigned "Cumulative impacts on the environmental side of the projects in Bhagirathi and Alaknanda river basins in Uttarakhand" study to AHEC IITR (Alternate Hydro Energy Centre, Indian Institute of Technology, Roorkee). AHEC submitted its report in March 2011, WII submitted its interim report about 5 projects² which had applied for Forest Clearance to MoEF. In May 2011, Forest Advisory Committee rejected Forest Clearances to three of these projects in the light of WII study.

Evidently, these are important reports, which, in the recent words of the PM at the third NGRBA meeting, would, "*guide what actions we need to take pending formulation of a long term policy*" for River Ganga. (<http://pib.nic.in/newsite/erelease.aspx?relid=82308>)

Unfortunately IIT Roorkee report in Cumulative Impacts of these projects was of such a poor quality that the EAC (Expert Appraisal Committee) for River Valley Projects of MoEF criticised the report and is refusing to follow the report. Civil society had rejected the report, which read like a mouthpiece of hydropower developers, without taking any considered, independent and unbiased stand. SANDRP had also prepared detailed critique³ of the report. A critique of the river-ecology aspects of the report

¹ 17 commissioned projects, 14 projects are under-construction and 39 are proposed projects.

² 195 MW Kotlibhel I A, 530 MW Kotlibhel I B, 530 MW Kotlibhel II all by NHPC, 444 MW Vishnugad Pipalkoti by THDC and 300 MW Alaknanda Project by GMR

³ See: http://www.sandrp.in/hydropower/Pathetic_Cumulative_Impact_Assessment_of_Ganga_Hydro_projects.pdf

by Emmanuel Theophilus, Himal Prakriti, Uttarakhand was also published⁴ by SANDRP. Most importantly, the report utterly failed in doing any sort of 'Cumulative Assessment' of the impact of the onslaught of dams.

In this context, the WII report is critical. While providing slick lip-service to terms like 'Cumulative Impact Assessment' and Sustainable Development, the MoEF is blatantly giving individual clearances to projects. In a remarkably shocking incident, the MoEF actually sanctioned a project in this region⁵ which has been rejected by the Forest Advisory Committee TWICE for the extensive and irreversible ecological damage it will cause and which had also been rejected by the interim report of the WII. This was done based on a representation from the project developers to the minister Ms Jayanti Natrajan! The minister is ready to listen to the vested interest party, rather than the expert environment body commissioned by the ministry!

By its mandate, the WII report can help assess the cumulative basin wide impacts of the massive projects being planned in the Bhagirathi-Alaknanda basins. It can also help initiate a discussion about the value we ascribe to outstanding, protected biodiversity, rivers and related natural resources and livelihoods of people that depend on them and the services that they provide, vis a vis our current development paradigm and planning and decision making processes.

The WII report, while suffering some serious flaws, has done a much better job of the task given to them than the AHEC report. The report has evolved thinking about some of the cumulative impacts, linked it with hydropower development and has devised a methodology for addressing these impacts, integrating bio diversity and impact values. The methodology comes up with multiple scenarios of cumulative impacts on sub basins with or without projects. Importantly, WII has moved away from project-centric impacts and has assessed cumulative impacts on terrestrial and aquatic ecology on sub basin level, dividing the two basins into 18 sub basins. Cumulative impacts can be seen better at a landscape scale, than a project scale. After a baseline study of the aquatic and terrestrial ecology of the region, the report has assigned biodiversity values to individual basins. Based on projects planned and their nature (Run of River/Storage), a scorecard for impacts has been made. In the final matrix, biodiversity scores and impact scores are superimposed to give an idea of the overall impact on the sub basin. These impacts range from low, moderate, high and very high.

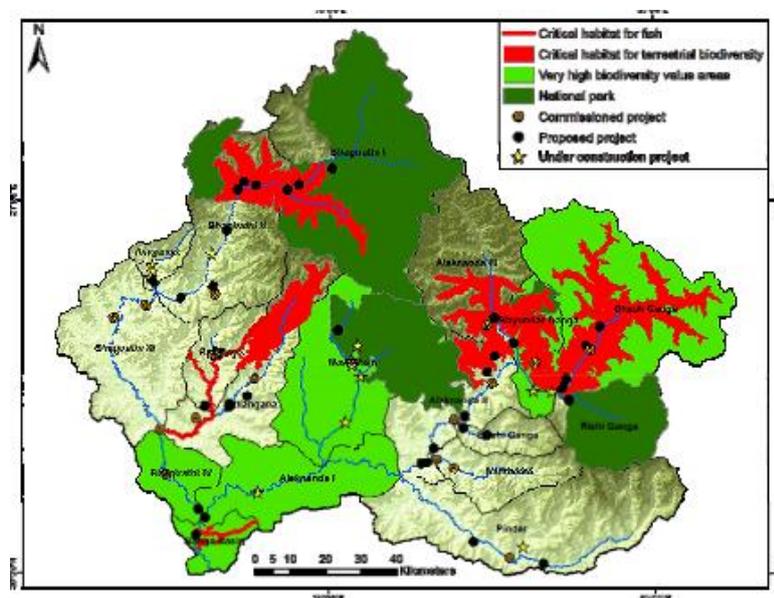


Figure 1 Critically important habitats of valued biodiversity components significantly overlap with locations of hydropower projects in the Alaknanda and Bhagirathi basins. (WII, April 2012)

Based on these cumulative impacts, ***“a list of proposed projects that may be reviewed for combined benefits of reducing impacts on both, aquatic and terrestrial biodiversity and for acceptable outcomes from hydropower development for biodiversity conservation and***

⁴ http://www.sandrp.in/rivers/Ganga_Basin_Report_by_AHEC-IIT_Roorkee-Review_of_River_Ecology_Aspects.pdf

⁵ 300 MW Alaknanda Project, proposed by GMR

societal well-being” has been put forth. The list of projects to be reviewed (recommended for exclusion/ scrapping) includes 24 projects. According to the report *“Ecological prudence requires that securing long term biodiversity conservation should get precedence over economic considerations visualized in commissioning these 24 projects.”* The list of these projects is given in the Table 1.

Table 1 List of proposed Hydro Electric Projects to be excluded for safeguarding aquatic and terrestrial biodiversity. Source: WII, April 2012

Sub Basin	Projects to be excluded	River	Capacity (MW)	Aquatic Impacts	Terrestrial Impacts
Balganga	Bal ganga II	Bal ganga	7.00	√	
	Jhala koti	Bal ganga	12.50	√	
Bhagirathi II	Bharon ghati	Bhagirathi	381.00		√
	Jalandrigad	Jalandhariga	24.00		√
	Siyangad	Siyangad	11.50		√
	Kakoragad	Kakoragad	12.50		√
Bhagirathi IV	Kotlibhel IA	Bhagirathi	195.00	√	√
Bhagirathi I	Karmoli	Jadhganga	140.00		√
Mandakini	Jadhganga	Jadhganga	50.00		√
	Rambara	Mandakini	24.00		√
Alaknanada I	Kotlibhel IB	Alaknanda	320.00	√	
Alaknanda III	Alaknanda	Alaknanda	300.00		√
	Khirao ganga	Khirao ganga	4.00		√
Alaknanda II	Urgam II	Kalpganga	3.80		√
Dhauliganga	Lata tapovan	Dhauli ganga	170.00		√
	Malari jhelam	Dhauli ganga	114.00		√
	Jhelam tamak	Dhauli ganga	126.00		√
	Tamak lata	Dhauli ganga	250.00		√
Bhyundar Ganga	Bhyundar ganga	Bhyundar ganga	24.30		√
Rishi Ganga	Rishi ganga I	Rishi ganga	70.00		√
	Rishi ganga II	Rishi ganga	35.00		√
Birahi Ganga	Birahi ganga I	Birahi ganga	24.00	√	√
	Gohana Tal	Birahi ganga	50.00	√	√
Ganga	Kotlibhel II	Ganga	530.00	√	√
TOTAL			2878.6		

Conservation reserves The report also recommends that rivers Nayar and Balganga, which are of critical importance for aquatic biodiversity, especially fish populations should be declared as fish conservation reserves and should be protected from further degradation and hydel projects. These two stretches are comparatively less disturbed and have critically important habitats for long term survival of Himalayan fishes.

Operating Projects For projects that are already operating, the study recommends that for regulating impacts, “Monitoring for compliance of clearance conditions and conducting environmental audits to identify areas of negligence in environmental management so that regulatory frameworks can be better tailored for ensuring the reduction in the combined footprint of all projects operating in the sub-basins.” However, it is an open secret that MoEF does not have the will, capacity or inclination to actually do this. Instead of having monitoring committees full of uninterested bureaucrats, it will be more effective if the committee has 50% local participation and the committees are empowered to make corrective recommendations when required.

While accepting dropping these 24 projects would mean reducing power generation capacity by 27%, the report significantly states that India has one of the world’s highest power transmission losses⁶ of about 30-40% against global average of 15%. Better and effective power transmission management

⁶ OECD/IEA, <http://www.iea.org/stats/index.asp> and <http://www.indexmundi.com/facts/india/electric-power-transmission-and-distribution-losses>

system can to a large extent offset this loss in power generation.” This is a welcome statement in the report as this and the falling per MW electricity production in India’s Hydro sector, non optimisation of peaking power generation and sanctioning of unviable capacities are some of the issues which are consciously ignored while lobbying for more dams.

While the WII study has some strengths, it also has some major lacuna which need to be addressed urgently:

- **Number of projects underestimated** Though this study mentions that only 70 projects are commissioned, under construction and in planning stage, the number is much more than 70. As an example, the study has not included commissioned projects like 144 MW Chilla , 0.4 MW Tharali, 0.8 MW Tapovan or planned projects like 745 MW Utyasu (I-IV), 745 MW on Birahi Ganga, 72 MW Bagoli or 44 MW Bangri. This is a very serious limitation. The AHEC study lists 244 projects in various stages in Uttarakhand, of which majority are in Alaknanda Bhagirathi basins. This number needs an urgent check and additional projects should be included in the list which will add to the cumulative impacts.
- **No mention of impacts of Peaking Power** All of the hydro power projects are supposed to generate maximum Peaking power, as it is supposed to be the USP (Unique Selling Proposition) of hydro projects. Peaking power, even if regulated with strict eflows norms can lead to huge downstream fluctuations in water levels, affecting ecosystems and communities. This has been one of the central points of discussion in basin studies of the North East Rivers like Lohit and Siang Rivers. However, the issue of Peaking does not find a single mention in the WII report. This is a huge omission and has to addressed, as it will have add to cumulative impacts, e-flows.
- **Livelihood Issues:** One more serious weakness of the study is that it does not give any consideration to livelihoods that depend on the ecological goods and services of the river systems in the region. It simply states “In addition to the expansion of urban areas, road building activities and in recent times the Hydro Electric Projects have further marginalized the individual landholding in Uttarakhand. ***These projects are certainly going to engulf the already marginalized productive agricultural fields, thus implying more hardship to the local population in times to come***”. It further states that degrading ecosystem goods and services from a flowing river impair social and economic development and can also lead to adverse influence on livelihoods, income, and local migration, which in turn may sometimes lead to unrest and even political conflicts.

There was a huge scope for studying these impacts and putting them in front of the decision makers so that the so called economic benefit could be compared with livelihood and ecological losses and seen in the right perspective. But the report has not done this. The impact scorecard devised by WII should have included impacts of the projects on settlements and villages, drinking water sources and streams, fisheries, riparian farming, groundwater recharge, fodder for animals, medicinal plant use, etc.

- **Aesthetic, Cultural, spiritual and religious values** do not find a mention in the entire report. AHEC IITR report has also not done this and this is a huge lacuna in both these reports. Considering the cultural importance of Ganga and Panch Prayags (five confluences namely Dev Prayag, Karna Prayag, Rudra Prayag, Nanda Prayag and Vishnu Prayag, the last of this stands destroyed by the Vishnuprayag HEP and the rest would be destroyed by the planned projects) in the hearts of millions of India, this omission is serious.
- **No mention of protected status of 135 kms of Bhagirathi River.**
- **No mention of cumulative impacts of allied activities** like road construction, muck disposal, quarrying, extracting material from riverbed, blasting, tunnelling, settlements, etc.
- Climate Change concerns and its impacts on biodiversity, methane emissions from storage reservoirs and their cumulative impacts find no mention in the report.
- No mention of **Glaciers, Climate Change** concerns and its impacts on biodiversity, methane emissions from storage reservoirs and impact of hydropower in the context of climate change, neither does it mention unique biodiversity value of the **cryosphere**.
- **No consideration of free flowing distance between two dams.**
- Cumulative impacts of changed silt flows on biodiversity and geomorphology in the downstream not even mentioned, leave aside assessed. This is a big omission of the report, since the changed silt pattern will have far reaching impacts on the aquatic and terrestrial biodiversity.

- The **environmental flows** section is a major limitation of the report. They have used methodologies based on the Ecological Management Class (EMC) and ecological needs of fish. The EMC methodology was put forth by Vladimir Smakhtin *et al* in 2007 and the authors themselves say in the paper: “*The set of indicators used here is very preliminary and the selection of indicators needs to be revisited. **Apart from the rather general nature of some indicators, no indicators relating to the social importance of rivers have been considered in the approach, at present. This is acknowledged as a serious limitation and one that needs to be addressed in future work.***”
 - Environmental flows are defined as: “Environmental Flows describes the quantity, quality and timing of water flows required to sustain freshwater and estuarine ecosystems and the **human livelihoods and well-being that depend on these ecosystems**’ (Brisbane Declaration 2007). The social aspects of eflows cannot be simply brushed away, like the WII Report does.
 - The report claims to have used the Building Block Methodology for calculating eflows, but there is no evidence given about it.
 - Thus, the eflows recommendations need to be reworked with a much more holistic perspective and till the time being, the releases mentioned in the report should be considered as the minimum threshold values.

These issues will need to be addressed in order to understand the whole range of cumulative impacts of these projects, which are much more than those depicted in the report. WII should be asked to work on these aspects as well and come out with a report that includes all the possible impacts and their mitigation measures.

In the meantime, recommendations made in the WII study should be urgently adopted by the MoEF, without any closed doors negotiations with project proponents. It is learnt that GMR Energy rejected WII impacts scores, and the MoEF even accepted their arguments before giving the forest clearance to the project. None of these discussions have been put in the public domain. Accepting private project proponent’s word against biodiversity scores developed by WII is clearly unacceptable. If there has to be any discussion, it has to be held in the open domain. Furthermore, there is very little logic in discussing the recommendations or negotiating with the proponents or the pro dam Uttarakhand government, it is evident that they will not accept these and there can be no unbiased, objective discussion with interested parties in this regard.

It is time for MoEF to take some hard decisions and walk its talk about Sustainable Development. The decision about the Forest and Environment clearances to all the projects that WII report has asked to be excluded, including the 300 MW Alaknanda Hydro of GMR group needs to be reviewed urgently. While WII needs to redo the study keeping above flaws in mind, the AHEC report should be rejected an independent, credible agency be given this responsibility. In the meantime, it would be in the best interest of everyone that MoEF suspends process of giving clearances to any new hydro project in the Uttarakhand. We need energy, but it need not be always at the cost of our life support systems.

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