

# Dams, Rivers & People

Working for water resources development as if democracy, people and environment matter

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## Comment on IMG (BK Chaturvedi) report on Upper Ganga Hydro and the river

### Report with Pro Hydro Bias does not do justice to its terms or to Ganga, people or environment

**Summary** A month after its submission to the Union Ministry of Environment and Forests, the Inter Ministerial Group on Upper Ganga basin Hydropower projects and Ganga river in general is yet to be put in public domain. A detailed perusal of the report shows that the report is hugely biased in favour of large hydropower projects, and has not done justice to the task given to it or to the Ganga river, people or environment. Out of the three non government members (out of total 15 members) on the Group, Dr Veer Bhadra Mishra expired during the working of the group. Rajendra Singh has given a dissent note, not agreeing with the report in its totality. The "alternative view" note from Sunita Narain, the third non-government member, is not much of an alternative and is not in the interest of the river, people or the environment. However, the fact that none of the non-government members have endorsed the report speaks volumes about the credibility of the report.

The recommendations of the IMG report are an exercise largely in supporting the interests of hydropower lobby in the name of balancing the power & development needs of the region and local people. The IMG has actually attempted to make 69 large hydropower projects in the Upper Ganga basin a fait accompli when only 17 of them are under operation and 14 are under construction. In many cases IMG has reached unscientific and unfounded conclusions. Some of the recommendations are also contradictory in some fundamental nature. In many cases IMG has made statements, and implied recommendations that are bad in law. In general, the report shows that IMG has poor understanding of the science of the rivers. Even where the IMG has sought to make some seemingly environment friendly recommendations, it is generally not serious about these recommendations.

A broad conclusion is inescapable that the IMG report (except the dissent note by Shri Rajendra Singh) is largely an exercise in deception, with a pro-hydropower bias. While this note points out key negative aspects of the IMG report, the IMG report is not without some positive aspects. The report gives a list of positive aspects of the IMG report on which there is a lot of scope for positive action, which the MoEF should initiate, while rejecting the report.

1. The Inter Ministerial Group (constituted by the Union Ministry of Environment and Forests through an order issued on June 15, 2012) report has been submitted around April 22, 2013, but it is still not in

public domain a month later. The report should have been promptly put in public domain as in the case of the HLWG report on WGEEP panel recommendation on the Western Ghats, which was made public

the day after the submission of the report to MoEF. These comments<sup>1</sup> are based on the hard copy of the final report made available by a colleague<sup>2</sup>.

**2.** The IMG final report has been endorsed by all members, except the dissent note by Rajendra Singh attached at Annexure X and a note on “alternate approach” from Sunita Narain, attached at Annexure XI. Shri Veer Bhadra Mishra, who was the third non-government member, expired during the period of functioning of the IMG group. The committee constitution was heavily loaded in favour of the government officers (ten of the fifteen members were government officials), so its independence was already in doubt. With none of the non-government members endorsing the report, the report has little credibility. This review tries to look at the report with an open mind.

**3.** While SANDRP as a group is critical of large, destructive and non participatory hydropower projects, it does not mean the group is against all hydropower projects. For example, if the projects were to be set up through a participatory and informed, decentralized, bottom up decision making process or if projects were to follow the recommendations of World Commission on Dams, such projects would certainly have greater public acceptance. That is not the case for any of the projects today.

**4.** The main TOR given to the IMG was to decide the quantum of environment flows for the upper Ganga basin rivers, keeping in mind the IIT (Indian Institute of Technology Roorkee, the report was basically from some individual of Alternate Hydro Electric Centre of IIT-R) and WII (Wildlife Institute of India) reports on cumulative impact assessment of the projects in these river basins. However, IIT (Roorkee) report has been found to be so flawed and compromised (for details see: [http://www.sandrp.in/hydropower/Pathetic\\_Cumulative\\_Impact\\_Assessment\\_of\\_Ganga\\_Hydro\\_projects.pdf](http://www.sandrp.in/hydropower/Pathetic_Cumulative_Impact_Assessment_of_Ganga_Hydro_projects.pdf)) that it should have been rejected by the MoEF and the NGRBA. Even the MoEF's Expert Appraisal Committee on River Valley Projects has been critical of the IIT-R report. However, since a member of the IIT-R was present on the IMG, it may not have been possible for the IMG to take an objective view of the merits of IIT-R report. It is however, welcome that IMG has relied on WII rather than IIT-R report while accepting recommendations on e-flows. WII report was better in some respects, though still suffering from some basic infirmities<sup>3</sup>. Moreover, to set up an IMG to decide on the course of action considering these two reports (and any other relevant reports) was compromised at the outset and was an invitation for further dilution of the environment norms, considering the track record of the



*Ganga river flowing through a channel, diverted for the 144 MW Chilla hydropower project*

most of the members of IMG.

**5.** The recommendations of the IMG report are an exercise largely in supporting the interests of hydropower lobby in the name of balancing the power & development needs of the region and local people. The IMG has actually attempted to make 69 large hydropower projects in the Upper Ganga basin a fait accompli when only 17 of them are under operation and 14 are under construction. In many cases IMG has reached unscientific and unfounded conclusions. Some of the recommendations are also contradictory in some fundamental nature. In many cases IMG has made statements, and implied recommendations that are bad in law. In general, the report shows that IMG has poor understanding of the science of the rivers. Even where the IMG has sought to make some seemingly environment friendly recommendations, it is generally not serious about these recommendations. All of these points are further elaborated in this note.

### **6. Cancelled projects & those on Bhagirathi Eco Sensitive Zone shown as under development**

Shockingly, even the projects like the Loharinag Pala, Pala Maneri and Bhairon Ghati that have been officially dropped are shown as under development by the IMG, see Annex VID! In fact in Table 12 and 13 IMG even calculates the reduction in power generation and increase in tariff at Loharinag Pala (among others) if the IMG recommended e-flows are implemented! The 140 MW Karmoli HEP on Bhagirathi, on a stretch that the MoEF has been declared as Eco Sensitive Zone, and on which the GOI has said no large hydro will be taken up, the IMG has actually suggested that the project can be taken up! The 50 MW Jadhganga project, very close to the Gangotri, is shown to be project under development

1 The author is thankful to Parineeta Dandekar, Shripad Dharmadhikary and Samir Mehta among others for providing comments on earlier drafts.

2 Prof Bharat Jhunjhunwala provided the copy.

3 For details see: <http://www.infochangeindia.org/water-resources/features/endangered-rivers-and-biodiversity.html>

by the IMG! These examples show how the IMG has played a role of supporter of the hydropower lobby.

**7. Wrong classification of projects as under construction and under clearance projects** IMG has divided the 69 hydropower projects in Upper Ganga basin (leaving out the Kotli Bhel 2, since it is on Ganga river and not on Bhagirathi or Alaknanda) in four categories: Operating projects, under construction projects, under clearance projects and under development projects. It is here that IMG has done its biggest manipulation by classifying a number of projects as under construction when they are not and cannot be under construction. IMG classification of projects under clearances is equally problematic. IMG and even the “alternative View” by Sunita Narian says all these projects in first three categories can go ahead without any change, except the e-flows recommendations. This manipulation shows the stark pro hydro-bias of the IMG.



*Dry Ganga river after the river is diverted for Chilla HEP. Photos by SANDRP*

**8. Manipulations about percentage length of river that the projects can destroy** On the one hand, the IMG has recommended that “projects may be implemented so that not more than 60% of the length (of the river) may be affected.” There is no mention how they have arrived at this magic figure of 60%, what is the basis or science behind that magic figure. At the same time the IMG has said that if all the 69 projects were to be implemented then 81% of Bhagirathi and 65% of Alaknanda will be affected. Firstly these numbers are not correct if we taken into account the full length of the reservoirs and the bypassed river lengths by the hydro projects, in many cases the length of the submerged reservoir behind the dam has not been counted. Here we need to add the fact that the reservoir of the 70<sup>th</sup> Project on its list, the Kotlibhel 2 project will submerge parts of both Bhagirathi and Alaknanda rivers, which has also not been counted by the IMG. WII had to recommend 24 projects to be dropped, and even after that, WII assessed that 62.7% of the rivers would still be affected. However, the IMG has made no recommendation as to which of the projects need to be dropped (except vague review of the projects in Annex VI-D) to

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achieve that magic figure of 60%. This again shows how non serious IMG is, making this recommendation meaningless.

**9. IMG double talk on distance criteria** The IMG has said that “There is a clear need to ensure that adequate river length is available to meet the societal needs and River gets adequate *time* during its flow to regenerate itself” (emphasis added). This sounds good. But IMG has shown no will or interest in ensuring that this happens. In fact IMG exposes its understanding on this matter when it says, “the distance between two hydro projects should generally be such as to ensure that over-crowding is avoided”. What is over-crowding, how do you define it? This is a funny word IMG has used, not even bothering to define it. However, when it comes to implementation, dumping all these requirements, IMG has justified smaller distance (read zero distance) between projects where gradient is high. Now let us understand this: where gradient is high, if the distance left between the projects is less, will the *time* the river flows between projects be smaller or greater than if the gradient is low? Clearly, if gradient is high, for the same distance, the river will have less time to travel than if the gradient were low. It is in fact the *time of free flow* that is a crucial driving parameter for river to regenerate itself. So if the river were to have the same amount of time to flow between two points, with higher gradient, river will require more distance, not less. This again exposes the poor understanding of IMG members about science of the rivers.

The IMG even goes on to say that “distance will have to be smaller in view of technical requirement of the hydro power. This could result in continuity in some cases.” Firstly it is clear here again that IMG is basically catering to the hydropower lobby, it is completely non serious about the environmental issues. That is why after all those great sentences, it goes on to say that it is the *technical* requirement of the hydropower project that will be the decider! If technical requirements means no distance between two projects, then river can disappear,

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environmental issues do not matter! In case of many projects where the distance of free flowing river between projects is very little or nil and where the construction has not started or has not progressed much, there is today scope for change. For example in case of Vishnugad Pipalkoti HEP on Alaknanda: the Full Reservoir Level of the VPHEP is same as the Tail Water Level of the upstream Tapovan Vishnugad HEP. This means that there is zero length of free flowing river between the projects. VPHEP does not have all the clearances and its construction has not started. Even for the upstream Tapovan Vishnugad HEP, the construction has not gone far enough and there is scope for change in both projects to ensure that there is sufficient length of free flowing river between the projects. IMG should have recommended change in parameters in this and other such cases, but it has done no such thing, it has shown no interest in any such matter! Even the “alternative approach” note in Annexure XI has not bothered to recommend such changes even while recommending 3-5 km free flowing river between two projects.

The IMG makes another unscientific statement in this context when it says, “With the recommendation of IMG for environment flow which will be available and which would have traveled throughout the diverted stretch, any significant gaps and large distance may not be required.” This is an unscientific, unfounded statement. Firstly where is the evidence that the environment flows that IMG has suggested would take care of the need for river to flow on stretches between the projects? Secondly, the need for river to flow between the projects to rejuvenate itself will also depend on the length of the rivers submerged by the reservoirs, and also depend on the biodiversity, the social, cultural and religious needs in addition to the ecological needs. By making such ad hoc unfounded statements devoid of scientific merit, the IMG has exposed itself.

While the IMG talks about the rich diversity of fish species and other aquatic diversity of the river, it has no qualms in saying that e-flows alone will address all the problems caused by bumper to bumper projects. As many including Government of India’s CIFRI (Central Inland Fisheries Research Institute) have concluded, Dams have been the primary reason for the collapse of aquatic diversity in India, not only because of the hydrological

modifications and lack of e-flows, but also because of the obstruction to migration they cause, destruction of habitat during construction, muck disposal, trapping of sediments, destruction of terrestrial (especially riparian) habitats. But these concerns are not even considered by the IMG while saying that recommended e-flows will be able to solve all problems caused by bumper to bumper projects.

**10. WII recommendation of dropping 24 HEPs rejected by IMG without any reason** The IMG notes that WII has recommended that 24 hydropower projects of 2608 MW installed capacity should be dropped in view of the high aquatic and terrestrial biodiversity. However, IMG decides to dump this WII recommendation without assigning any reasons. This again shows the strong pro hydro bias of the IMG. WII report says that even after dropping these 24 projects, at least 62% of the river will be destroyed.

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It is shocking that projects like Kotlibhel 1B and Alaknanda HEP, which have been rejected by WII and Forest Advisory Committee, is considered as “under development” by IMG, when they should have been rejected. While the IMG Report talks of unique biodiversity of the Ganga Basin, Valley of Flowers and Nanda Devi National Parks, it still supports projects which will be affecting these National Parks like the 300 MW Alakananda GMR HEP, which was also rejected by the WII and FAC (twice).

As a matter of fact, of the 24 projects that WII report recommended to be dropped, the IMG has shown 8 as under construction and 4 as “projects with EC/FC clearances”. This is sheer manipulation, in an attempt to make them a fait accompli. Strangely, the “alternative approach” note in Annexure XI does not say anything about this manipulations and in fact says the projects in Annexure VI-B and VI-C can go ahead!

**11. Non serious recommendation about keeping six tributaries in pristine state** IMG (Para 3.70) “recommends that six rivers, including Nayar, Bal Ganga, Rishi Ganga, Assi Ganga, Dhaulti Ganga (upper reaches), Birahi Ganga and Bhyunder Ganga should be kept in pristine form and developments along with measures for environment up gradation should be taken up. No new power projects should be taken up in these River Basins.” This sounds good, but turns out to be like a joke, since firstly, IMG recommends construction of

projects on these rivers that yet to be constructed! If these rivers are to be kept in pristine state then IMG should have asked for immediate stoppage of under construction projects and also time bound decommissioning of the operating projects on each of these rivers. In stead, the IMG report shows that projects are under construction on rivers like Assi Ganga (stage I and stage II projects each of 4.5 MW), Birahi Ganga (24 MW stage I project), Bal Ganga (7 MW stage II project listed in Annex VI B of IMG report, in addition to the 1 MW Balganga and 5 MW Balganga I project are also under construction as per IIT Roorkee report) and Bhyunder Ganga (24.3 MW stage II project) and IMG has (implicitly) recommended that these projects be allowed to continue, on rivers that IMG says it wants to remain pristine! Moreover, Rishi Ganga (13.2 MW project) and Birahi Ganga (7.2 MW) have operating projects on these rivers to be kept pristine! In addition, on Assi Ganga the 9 MW stage III project, is considered by the IMG as ready for development since it has some of the clearances.

The IMG has noted that 70 MW Rishi Ganga Stage-1 and 35 MW Stage II Project are under development on Rishi Ganga (IIT-R report mentioned another project on Rishi Ganga, namely the 60 MW Deodi project, it is called Dewali project by WII report; WII report also mentions 1.25 MW Badrinath II existing project on Rishi Ganga) and 24 MW Birahi Ganga-II project is under development. But the IMG does not recommend dropping of these projects.

So at least five of the six rivers that the IMG claims it wants to stay in pristine state are no longer pristine! They have multiple projects, most of them under construction or yet to be developed and the IMG has not said that any or all of these projects should be stopped, cancelled and those under operation be decommissioned in time bound manner. Even on Nayar, the sixth small tributary that IMG said should be kept in pristine condition has a 1.5 MW Dunao project under development by UJVNL, as per the UJVNL website. It's clear how non serious IMG is about its own recommendation. IMG has included Dhauli Ganga (upper reaches) in this recommendation, but has not even bothered to define which stretch of the Dhauli Ganga this applies to, again showing the non-seriousness of IMG.

In para 4.22 IMG says, "Specifically, it is proposed that (a) Nayar River and the Ganges stretch between Devprayag and Rishikesh and (b)... may be declared as

Fish Conservation Reserve as these two stretches are comparatively less disturbed and have critically important habitats for long-term survival of Himalayan fishes basin." If IMG were serious about this, they would have also said that Kotli Bhel II project should be cancelled since it is to come in this very stretch.

IMG's claim that not having *any more projects* on these six streams will mean loss of generating capacity 400 MW is also not backed by any sort of information or list of projects to be dropped, it seems IMG is in the habit of making such claims and does not feel the need to back them.

**12. IMG on environmental impacts of Hydropower projects** One of the key TORs given to IMG was "to make a review of the environmental impacts of projects that are proposed on Bhagirathi, Alaknanda and other tributaries of river Ganga and recommend necessary remedial action." What has the IMG done about this TOR? IMG wrongly claims (Para 4.18), "The environment impact of proposed 69 hydropower projects has been considered by IMG." It has done absolutely no justice to this very crucial TOR. First thing IMG has done in this regard is to dump the WII recommendation to cancel 24 hydropower projects, without giving any justifiable reasons. The IMG has produced a set of guidelines for the hydropower projects, which have almost nothing new, they are certainly not comprehensive or legally binding. They miss the most important issues of inadequate environment impact assessment, inadequate public consultation process, inadequate appraisal, lack of accountable governance and compliance.

What is required is certainly not new set of guidelines. MoEF already has a long list of environment and forest clearance conditions, environment management plans and manuals. But there is no interest, will or willingness to achieve compliance in MoEF. IMG is obviously aware of this state of affairs. Yet they have happily prepared a new set of five page guidelines just to show they have done something about this TOR. The "alternative approach" in Annex XI also has nothing to offer on this score.

IMG "recommends that six rivers, including Nayar, Bal Ganga, Rishi Ganga, Assi Ganga, Dhauli Ganga (upper reaches), Birahi Ganga and Bhyunder Ganga should be kept in pristine form". This sounds good, but turns out to be like a joke, since firstly, IMG recommends construction of projects on these rivers! In fact detailed scrutiny of the projects IMG has given green signal shows that none of these would be pristine, due to IMG recommendations. This is shocking double speak of IMG.

**13. Unwarranted conclusion about BBM methodology** The IMG has said, "Considering environment, societal, religious needs of the community and also taking into account the status of river Ganga as national river, the IMG recommends adoption of Building Block Methodology (BBM) for assessing the e-flow requirement". This is good

and needs immediate and credible implementation.

However, IMG says this will be applicable only “in situation where the required conditions are satisfied and resources, time and data are available.” The only basis for this conclusion by IMG is the fact that WWF took three years to do a study of environment flow requirements of three sites along Ganga involving large number of experts. This is clearly an unwarranted conclusion since WWF was only doing it first time and has much less resources at its disposal than the government have. By arriving at this unjustified conclusion that has no basis, the IMG implies is that BBM methodology is required and is justified, but Indian rivers including the Ganga won't get it since IMG (wrongly) thinks that “required conditions” are not satisfied. This is clearly wrong and unwarranted conclusion. The BBM can and must be applied in all cases immediately, including for all existing and under construction projects and cumulative impact assessments.

Also, while stating multiple times that BBM for three locations for Ganga took three years, the IMG does not go into the details of what caused this delay. One of the important reasons stated by WWF itself is that required data was not made available to them, which contributed to the delay. So it is the government itself that was part of the reason for the delay in WWF study, and now IMG uses that delay to suggest that BBM is not practicable for Ganga! If the Government has the will to implement a more holistic methodology like BBM, it can be done and IMG conclusion is unwarranted and wrong.

**14. Unjustified pro hydro bias of the IMG** The IMG has shown its pro hydro bias at several places. At one place it says that a balanced approach needs to be taken as “It is important to see that the flows do not result in exorbitant cost of power which the people of the region may not be able to afford. This would make these power projects uneconomic and un-implementable”. Firstly, as far as people in immediate neighbourhood of the projects are concerned, history of grid connected hydropower projects in India shows that local and particularly the affected people almost never get power benefits from projects but they surely suffer all the negative impacts. IMG is wrong as far as this section of the people is concerned.

Secondly as far as the people of Uttarakhand in general are concerned, where all the projects in Upper Ganga basin are situated, the state would get 12+1 % of free

power. Since most of the projects are in central or private sectors, the rest of the electricity would mostly go outside the state. As far as this 13% free power is concerned, since it is supposed to be free, there will be no impact of e-flows on the tariff of such projects, except some marginal reduction in quantum of power.

Lastly, is it the bottom line of the IMG that projects must be economic and implemented at all costs, by hook or by crook, as is apparent from the above quoted sentence? How can that be the bottom line of IMG considering its TORs? Moreover, by making the projects economic and implementable by hook or by crook, the IMG seems to be saying that irrespective of the social, environmental, cultural, religious and even economic costs, the projects must go on. Thus what IMG is suggesting is that artificially low cost electricity must be produced for the cities and industries irrespective of any concerns of costs and impacts on people, environment, future generations and rivers including the national river! This is clearly a plea

to export the water, livelihood and environment security of the people for the short term economic prosperity of far off city dwellers and industrialists. Is this acceptable?

**15. What is environment flow?** IMG should have provided a definition of what is meant by river and environment flow. Since it is linked with enabling the

river to perform its various roles and services in the downstream area, it cannot be just limited to water flow downstream. The downstream river also needs silt and nutrition from the upstream and the biodiversity and geomorphology in the river crucially depends on such flows of nutrition and silt. However, IMG has said nothing on this count.

**16. Environment flows = aviraldhara?** The IMG has said, “Environment flows in the river must lead to a continuous availability of water (aviraldhara) in the river for societal and religious needs.” This equation of *aviral* river with continuous flow of water is clearly flawed, since by that token even a pipeline has aviraldhara, but a pipeline is not the same as *aviral* River. For a river to be flowing *aviral*, continuous flow of water is a necessary but not a sufficient condition. A river means so much more.

**17. No attempt at assessment of social, religious, cultural needs** The IMG keeps talking about social, religious and cultural perspective and needs of the society from the river and so on. However, there has been no attempt to assess what exactly this means in terms

MoEF already has a long list of environment and forest clearance conditions, environment management plans and manuals. But there is no interest, will or willingness to achieve compliance in MoEF. IMG is obviously aware of this state of affairs. Yet they have happily prepared a new set of five page guidelines just to show they have done something about this TOR. The “alternative approach” in Annex XI also has nothing to offer on this score.

Thus what IMG is suggesting is that artificially low cost electricity must be produced for the cities and industries irrespective of any concerns of costs and impacts on people, environment, future generations and rivers including the national river! This is clearly a plea to export the water, livelihood and environment security of the people for the short term economic prosperity of far off city dwellers and industrialists.

of river flow, quality, content of flow across the time and space. More importantly, how is all this to be decided and who all are to be involved in the process. IMG just assumed that this has already been done by IITR and WII, which is flawed assumption, since WII or IIT-R has clearly not done any such assessment. So in stead of giving standard monthly flow release percentage across the rivers (releases to vary based on daily flow variations, this recommendation of daily changing flow is certainly an improvement from IMG), IMG should have asked for actual assessment of such needs across the rivers and IMG should also have given the process for arriving at such decisions. But while deciding social, religious or cultural needs, the IMG sees no role for the society, religious groups or cultural institutions.

In this context it may be added that the IMG has also not taken note of the legal stipulations like the order of the Allahabad High Court that says that no project can divert more than 50% of river flows existing at the point of diversion.

**18. IMG recommendation during High Flow Season (May-Sept)** The IMG has recommended 25% of daily *uninterrupted* (no clear definition is given how this will be arrived at) flow, with the stipulation that the total inflow in the river would not be less than 30% of the season flows. This is same as 30% of mean seasonal releases recommended by WII (para 8.3 of WII report, para 4.11 of IMG report) and also used by even Expert Appraisal Committee on River Valley Projects currently. The recommendation of releases based on daily flow is an improvement compared to the earlier situation, but its implementation is in serious doubt considering the weak compliance requirements from IMG.

It should be added here that IMG has not mentioned *how* the environment flow will be released. Just dropping it from the top of the dam won't help, the flow must be allowed to flow downstream in an environmentally sound manner that is as close as possible to the flow of the river and helpful for the biodiversity in the river to link up from downstream to upstream and vice versa. Moreover, while deciding flows, IMG has largely followed the recommendations of the WII. However, WII conclusion of classifying Upper Ganga basin under EMC class

C itself is flawed. IMG should have corrected this flaw, before concluding on environment flows.

**19. IMG recommendation during Lean Flow season (Dec-March)** The IMG has recommended (Para 3.48) release of 30% of daily uninterrupted river flows, this will go up to 50% where the average monthly river flows during lean season (Dec-March) is less than 10% of average monthly river inflows of the high flow season (May-Sept) and to 40% (however, Para 3.51 does not mention this 40% norm) where this ratio is 10-15%. While this is an improvement in the current regime, this remains weak considering that IMG has not done project wise calculations where 30, 40 and 50% stipulation is applicable, which it could have easily done at least for the existing and genuinely under construction projects.

**20. IMG recommends lower flow for India's national river compared to what India promises Pakistan in Jhelum basin** The IMG has recommended 30-50% winter flows for all projects as described above. This in case of a river everyone recognizes as the heart and soul of India, a river that has such an important social, religious, spiritual significance and it has been declared as the national river. Let us compare this with what e-flows Indian government has promised to Pakistan downstream of the Kishanganga Project in Jhelum river basin in Kashmir. In a case before the Permanent (International) Court of Arbitration (PCA), Indian government has assured that India will release more than 100% of the observed minimum flow from the dam all round the year, and now in fact the government is considering even higher than 100% of the observed minimum flow all round the year. The PCA is yet to decide if what India has proposed will be sufficient or more water flow is required. So, as against the assurance of more than 100% of minimum flow at all times on another river, for the river flowing into another country; for the national river Ganga, for India's own people and environment, all that the IMG recommends is 30-50%. On most winter days, Kishenganga River downstream of the hydropower project, flowing into Pakistan, thus will have higher proportion of its daily flows than what Bhagirathi or Alaknanda will have.

**21. Monitoring and compliance of Environment Flows** The IMG has said that effective implementation is cardinal part of its recommendations. This is good intention. However, by asking the power developer to be responsible for the implementation, the IMG has made the recommendations ineffective. IMG has chosen to ignore the fact that there is clear conflict of interest for the power developer in assuring e-flows, since the e-flows would reduce the power generation and profits of the developer. Its faith in IT based monitoring is also completely untested and there is no evidence to show that such monitoring will be free of manipulation. Sec-

The IMG keeps talking about social, religious and cultural perspective and needs of the society from the river and so on. However, there has been no attempt to assess what exactly this means in terms of river flow, quality, content of flow across the time and space. More importantly, how is all this to be decided and who all are to be involved in the process.

only, to ask the MoEF to do annual review, that too only for first five years ignores the track record of MoEF in such matters where MoEF has shown no will, capacity or interest in achieving post-clearance compliance of the environment laws of the country. Thirdly, to require this only for projects above 25 MW shows the lack of understanding of IMG as to how important the smaller streams are for the water, ecology and livelihood security of the community in hills. Its recommendation of monitoring by an independent group is welcome, but lacks credibility in the absence of sufficient involvement of local community groups in such a mechanism.

**22. Baseless assumption of low water requirement for fish in the Himalayan region** The IMG has assumed that in the Himalayan region, the water requirement for fish in the river is less and hence the rivers here will not require as much water as the rivers do in the plains. This is completely unscientific, flawed and baseless assumption. The amount of e-flows needed has to be assessed not only based on the requirement of fish (IMG has not done even that assessment), but entire aquatic and connected terrestrial biodiversity across the seasons, in addition to the water needs of a river for providing the social and environmental services.

**23. Suggestions that are bad in Law** The IMG report shows several projects as “Under Construction” (Annex VI B) category, when they do not even have statutory clearances and hence cannot even legally start the work. This is a ploy to make these projects a fait accompli when these projects are perfectly amenable to review and rejection since the project work has not started. In fact to categorise such projects without having all the statutory clearances (e.g. Vishnugad Pipalkoti does not have forest clearance) as under construction project is plain illegal.

**24. Wrong representations** The IMG has shown several projects in Annex VI C, as “Hydropower projects with EC/FC Clearances and others”, basically a ploy to push the projects that do not even have all the statutory clearances. None of these projects have all the statutory clearances and are certainly not in position to start construction and hence these projects are the ones where dropping of the projects or modifications in dam loca-

tion, dam height, FRL, HRT length, e-flows, capacities etc are still possible. But IMG did not do it for any of the projects. As mentioned above, four of these projects have been recommended by WII to be dropped, and IMG should have recommended dropping these or should have categorized them as ‘to be reviewed’.

**25. No mention of impact of peaking operation of hydropower projects** The IMG has missed many crucial environmental impacts. One crucial one that it has missed is the issue of peaking operation of hydropower projects on the downstream people, environment, flood plains, geo morphology, biodiversity and other aspects

By asking the power developer to be responsible for the implementation, the IMG has made the recommendations ineffective. IMG has chosen to ignore the fact that there is clear conflict of interest for the power developer in assuring e-flows, since the e-flows would reduce the power generation and profits of the developer. Secondly, to ask the MoEF to do annual review, ignores the track record of MoEF in such matters where MoEF has shown no will, capacity or interest in achieving post-clearance compliance of the environment laws of the country.

of the river. This is very important since one of the Unique Selling Proposition (USP) of hydropower projects is supposed to be that they can provide peaking power. However, peaking operation means sudden changes of huge magnitude of flows in downstream river, having far reaching impacts including those on safety of people, flood plain cultivation, impacts on cattle and property, impact on ecology, amongst many others. The IMG has completely missed this, which is very strange since this is a huge issue being taken up by people and campaigns in the North East against large hydropower projects there.

**26. IMG cannot see through poor work of IIT-R** It is well known that IIT-R report on Ganga basin study is of poor quality. In the IMG report there is an attempt to respond to only a couple of the criticism of IIT-R report, but IMG could not even see through the wrong facts presented by IIT-R report. For example, IMG report says, “The requirement of flushing during monsoon is not required in both rivers as all hydro projects except Tehri reservoir are run of river types where silt is not stored.” This is completely wrong. All the projects, even if run of the river, have storage behind the dam where the coarser silt will settle down and will need to be flushed out periodically. The dams are being provided with bottom sluices to facilitate this. A quick perusal of the EIA reports of some of the hy-

dropower projects in the region shows that Vishnugad Pipalkoti, Srinagar, Kotli Bhel 1-A, Kotli Bheal 1-B, to name only a few all have proposed to provide bottom sluices for periodic release of silt accumulated behind the dam. Thus the contention that most projects do not need flushing is wrong. In any case, for all projects, the de-silting chambers would be releasing silt laden water and there is no attempt to assess the cumulative impacts of such actions. IMG's attempt to provide scope for some defense for the IIT-R has clearly back fired on IMG! Moreover, even in case of Tehri, the biggest project in the region under review, IMG report has nothing at all, about its social, environmental impacts and performance, about its power generation, irrigation, water supply, flood control performance or even its silt management performance.

The contention that all projects except Tehri are ROR is entirely wrong and misleading. Even as per the WII report, out of the 69 projects, a whopping 13 projects are storage projects. This includes the biggest and most problematic projects like Srinagar, KotliBhel IB, Kotlibhel IA, Koteswar, Vishnugad Pipalkoti, Devsari, etc.

### 27. IMG on Srinagar HEP and Dharidevi Temple

The IMG was also asked to "review the impacts of the Alaknanda (GVK) Hydro Power Project on flow of the River and the issues related to the temple relocation." The IMG gave an interim report on this issue, which was so disappointing that Rajendra Singh and Late Shri Veer Bhadra Mishra both members of the IMG, gave a dissenting note, Rajendra Singh also suggested shelving the project. The IMG rejected the suggestion of its own members without giving any justifiable reasons.

**28. Time bound action plan for E-flows from existing projects** The IMG says that the existing projects should also follow the suggested e-flows and this should be achieved in three years (Para 3.52). However, IMG should have been more clear about the role of different agencies (MoEF, state government, developers, state electricity regulatory commissions and power purchases) and what is the legal backing such a step will have.

**29. Lack of understanding of conflicting projects and public protests** The IMG report, Annex VI B shows 12.5 MW Jhalakoti (wrongly) as under construction project. In fact the Jhalakoti project has been recommended by WII to be dropped. The IMG seems to have no clue that Jhalakoti project is being strongly opposed by the local communities and no work has started on the project. The under construction status given by IMG for this project is clearly wrong. If the Jhalakoti HEP comes up then the existing 40 KW Agunda micro HEP will no longer be able to function. Many of the other projects including the Devsari and Vishnugad Pipalkoti HEP are also facing strong opposition, but the IMG has

not taken note of these or any of the social impacts of the projects in the Upper Ganga basin.

### 30. IMG on TOR on pollution abatement in Ganga

It is good to see that IMG has suggested that "all users must be forced to plan for water needs based on what

It is good to see that IMG has suggested that "all users must be forced to plan for water needs based on what the river can spare, not what they can snatch." The suggestion that "there will be a clear conditionality in Central government funding, which is matched to the quantum of ecological flow released by the state in the river" is welcome. Incentivisation of use of innovative bioremediation and in-situ drain treatment are also welcome. However, IMG has shown no interest in tackling the real problem in river pollution: Lack of participatory, democratic governance in urban water and pollution control regime.

the river can spare, not what they can snatch." However this should not mean an advocacy for more big dams and storages on the rivers. This seems to be the case when we read the IMG recommendation that says, "The government then has a choice to build storages to collect monsoon water for dilution within its territory or to 'release' water to rivers and make other choices for use in agriculture, drinking or industry". Storages can come in many forms and sizes and IMG should be careful not to recommend more big storages on the rivers. The suggestion that "there will be a clear conditionality in Central government funding, which is matched to the quantum of ecological flow released by the state in the river" is welcome. Linking of JNNURM-II and National Mission for Clean Ganga to the above norm, incentivisation of use of innovative bioremediation and in-situ drain treatment are also welcome. However, IMG has shown no interest in understanding or tackling the real problem in river pollution: Lack of participatory, democratic governance in urban water and pollution control regime.

IMG has recommended in Para 6.7(i), "Ecological flow will be mandatory in all stretches of the river." This is welcome. IMG goes on to suggest some norm for the urbanized stretches of rivers, but no norms are suggested for the non urbanized stretches of river in the lower river basin.

### 31. Report does not reflect the discussions in IMG?

The dissent note by Shri Rajendra Singh, a member of IMG says that on several aspects, IMG report does not reflect what transpired in the IMG meetings. This is a very serious charge that puts a big question mark on the IMG report and its recommendations, particularly since

Rajendra Singh is the lone independent voice in the IMG after the sad demise of Shri Veer Bhadra Mishra<sup>4</sup>.

There are five holy prayags (confluence of rivers) along Alaknanda river in Uttarakhand, including Deoprayag, Vishnuprayag, Karnaprayag, Rudraprayag and Nandprayag. Vishnuprayag has already been destroyed by the 400 MW existing Vinshnuprayag HEP of Jaiprakash Associates, rest would be destroyed by the projects listed by IMG. The IMG keeps talking about cultural importance of the rivers, but has not said how it plans to save these culturally important confluences and how it plans to rejuvenate the Vishnuprayag already destroyed.

**32. Incomplete project list** The IMG does not seem to have full information about the existing, under construction and planned hydropower projects in the Upper Ganga basin in Uttarakhand. Some of the projects not listed in the IMG report include:

- A. Operating projects under 1 MW: According to the website of UJVNL (Uttarakhand Jal Vidhyut Nigam), the state has 12 such projects with total capacity of 5.45 MW, see for details: [http://www.uttarakhandjalvidyut.com/cms\\_ujvnl/under\\_operation1.php](http://www.uttarakhandjalvidyut.com/cms_ujvnl/under_operation1.php). Most of these projects are in Upper Ganga basin, though it is not clear how many.
- B. UJVNL has larger list of schemes under development by UJVNL including in the Upper Ganga basin, not all of them are included in the IMG list, see: <http://uttarakhandjalvidyut.com/bd2.pdf>.
- C. Private sector has been given license for a large number of hydropower projects, not all the projects of Upper Ganga basin here are on IMG list, see for full list of projects being developed by IPPs in Uttarakhand: <http://uttarakhandjalvidyut.com/Hydro%20Projects%20Being%20Developed%20by%20IPPs.pdf>

- D. There is another “full list” of hydropower under development in Uttarakhand including sub-MW size projects, see: <http://uttarakhandjalvidyut.com/bd5.pdf>. Some of the projects here in Upper Ganga basin do not figure on IMG list.

One would expect better information base of the IMG than what they have shown.

**33. No specific recommendation to save the prayags** There are five holy prayags (confluence of rivers) along Alaknanda river in Uttarkhand, including Deoprayag, Vishnuprayag, Karnaprayag, Rudraprayag and Nandprayag.

Vishnuprayag has already been destroyed by the 400 MW existing Vinshnuprayag HEP of Jaiprakash Associates, rest would be destroyed by the projects listed by IMG. The IMG keeps talking about cultural importance of the rivers, but has not said a word about how it plans to save these culturally important confluences and how it plans to rejuvenate the Vishnuprayag already destroyed.

**34. “Alternative View” in Annexure 21: How much of an alternative is it?** In Annexure XI of IMG report,

One of the three principles listed in the Annexure XI note says: “Distance between projects: 3-5 km”. The note does not say how this distance has been arrived at or how this distance is to be measured. Most importantly, there is not even any attempt to apply this criterion to the projects that IMG is supposed to look into. On the contrary, the note says that “The projects under construction can be built” and “projects with EC and FC clearances can be taken up for construction”. So in fact there is absolutely no application of the criterion to the projects on hand. The conclusion that this is half baked and non serious criterion is inescapable. Same is the situation with another of the three criteria.

<sup>4</sup> One of the members of the IMG started discussing the report in public domain through her writings even before the report was in public domain, see: <http://www.downtoearth.org.in/content/training-engineers-not-ganga> and <http://www.downtoearth.org.in/content/ganga-saga-part-ii-redesign-dams-not-rivers>. This can create misleading impression about the report, when the readers do not have benefit of cross checking what the report is actually saying. The articles in any case are full of serious errors, for example it said: “Most of the proposed projects are run-of-the-river schemes, which are seemingly benevolent as compared to large dams”, not understanding that EACH of the so called run of the river schemes ALSO involves a dam, most of them are large dams as per international definition. It incorrectly said, “Run-of-the-river projects, which used flowing water as the raw material for energy”, in reality NONE of the so-called ROR projects generate power from flow of the water in the river, they all dam and divert the water away from the river to produce power. It also tried to dilute the impact of the projects on rivers (akin to killing of rivers) by saying projects “affect” rivers. It misleadingly wrote, “The hydropower engineers argued for 10 per cent e-flow” without mentioning that the EAC of MoEF is prescribing 20-30% of mean season flows. The article claimed that figures of water flow and tariffs were modified by IIT-Roorkee, but in the entire IMG report, (except the Annexure XI written by author of the articles), there is no mention of any of these. The article talks about engineers’ claims that “this source provides power during peak demand hours”, but as we noted above the IMG has not even looked at the impact of peaking generation. There is not even an attempt to understand how much of the current generation from hydropower projects is happening during peaking hours, or what is the generation performance of hydropower projects, issues that SANDRP has been raising for many years.

a note authored by one of the IMG members, Sunita Narian of Centre for Science is given, it is titled: "TOR (ii): Alternative View: Environment flow". The Annexure opens with the line "The recommendations of this IMG report are not acceptable." It is not clear if this sentence applies to all the recommendations of the IMG or about environment flows mentioned in the title or it applies to TOR (ii) that applies to all environmental aspects, not just environmental flows. The Annexure also deals with some issues besides environment flows, so one assumes this "alternative view" is about environmental aspects of hydropower projects.

The Annexure XI seems to give an impression that, principles of distance between dams, ecological flow and limit on % of river than can be "affected" will lead to "sound hydropower development, balanced for energy and environment".

One of the three principles listed in the note says: "Distance between projects: 3-5 km". The note does not say how this distance has been arrived at or how this distance is to be measured, the least the note should have mentioned was that this is not distance between projects but distances of flowing river between the Tailwater level of upstream and full reservoir level of downstream project. No elaboration is given about this criterion at all. Most importantly, there is not even any attempt to apply this criterion to the projects that IMG is supposed to look into. On the contrary, the note says that "The projects under construction can be built" (point 7(ii)) and "projects with EC and FC clearances can be taken up for construction" (point 7(v)). So in fact there is absolutely no application of the criterion to the projects on hand. The conclusion that this is half baked and non serious criterion is inescapable.

Another of the three principles listed in Annexure XI is: "Maximum intervention allowed in river length: 50-60 per cent". Again there is no elaboration as to how these figures are arrived at, why there is a range, what is meant by "intervention", which lengths it will apply and so on. Again, the note does not bother to apply this criterion to the rivers under review and actually says in point 7(ii) and 7(v) described above, that projects in Annexure VI (B) and VI(C) can go ahead without even checking if in that case this criterion will be violated or not. Again the conclusion that this is also a half baked and non serious criterion is inescapable.

The whole of the Annexure XI is basically devoted to application of the third principle: "Ecological flow regime: 30/50 per cent (high and lean period)". About this, the annexure says: "The engineering design of the uninterrupted flow would take into account the need for sediment and fish transfer", not clear how this will be achieved. The Annexure does not suggest any new measure of achieving compliance with its rec-

ommendations. The note mentions "design changes incorporated to maximize energy generation during high discharge season" but does not elaborate what these would mean.

Annexure XI says that IIT-R tried to suggest that e-flows must be low and in this effort did "big and large manipulation of data". This is good. However, it would have been better if the full data and notes from IIT-R were annexed here to illustrate how the manipulation was done.

Bullet point 3 in Annexure XI reads, "It is important to consider that water of a river is similar to the coal or gas as raw materials used in thermal plants". This statement needed to be qualified that the impact of taking out coal or gas from its source is not comparable to taking out water from the river, the latter's impact is much more severe, since river is not equal to just water flowing in it.

Since Annexure XI does not raise objection to any other conclusions and recommendations of the IMG except the three principles mentioned above, it would not be incorrect to assume that author agrees to the rest of the IMG report. This, when taken together with the fact that at least two of the three principles in the alternative view note have not been applied to the projects under review, leads to the conclusion that there is not much of an alternative in "alternative view" note and this won't help the cause of the river, people, environment or even sustainable and sound development.

**35. Conclusion** A broad conclusion is inescapable that the IMG report (except the dissent note by Shri Rajendra Singh) is largely an exercise in deception, with a pro-hydropower bias. While this note points out key negative aspects of the IMG report, the IMG report is not without some positive aspects. One of the positive aspect of this report is that possibly for the first time heads of central organizations like CWC and CEA have sat with some non government members to discuss some

Since Annexure XI does not raise objection to any other conclusions and recommendations of the IMG except the three principles mentioned above, it would not be incorrect to assume that author agrees to the rest of the IMG report. This, when taken together with the fact that at least two of the three principles in the alternative view note have not been applied to the projects under review, leads one to the conclusion that there is not much of an alternative in "alternative view" note and this won't help the cause of the river, people, environment or even sustainable and sound development.

important subjects that have remained contentious for these official agencies.

However, as noted above, on most positive aspects, while IMG has been less than sincere, there is a huge potential to take the environment flow movement forward.

The MoEF and NGBRA should, considering all the above points, take some positive aspects forward. Some of the positive retrievable aspects of the IMG report include the following, on each of which there is a lot of scope for serious action:

- **Ensuring at least 50% E-flows in non monsoon months in all rivers.**
- **Keeping some rivers in pristine form, stopping all ongoing and planned projects on suggested rivers and time bound decommissioning of existing projects on such rivers that are to be in pristine form. This should be immediately implemented on the rivers recommended by IMG and also in other selected rivers in all river basins.**
- **Rejecting planned and under construction projects which have high impact on terrestrial and aquatic biodiversity, as per score developed by WII Report as well as projects which irreversibly impact spiritual and religious places like rivers, prayags, places of worship and ghats.**
- **Give deadline of one year and maximum of two years for all the existing dams, diversions and hydropower projects across the Ganga basin (& other rivers) to achieve the suggested e-flows with clear inbuilt mechanisms for monitoring and compliance with participation of river basin communities, as a first step.**
- **Accepting BBM as the standard methodology for E-flows assessment, e-flows to mimic the river flows and involving communities as an important stakeholder in this methodology.**
- **Ensuring Aviraldhara.**
- **Ensuring rivers have adequate free flow *time* between projects to regenerate itself. Mandating at least 5 km free flowing river between any two projects as an immediate measure pending site specific studies and reviewing all under construction, under clearance and under development projects in the basin keeping this in mind.**
- **Releases based on daily flows rather than monthly or seasonal averages in all rivers. Define uninterrupted flows to arrive at uninterrupted daily flows.**
- **Monitoring of e-flows and other environmental compliance by independent group involving at least 50% of the monitoring group from local communities.**
- **Assuring that e-flows through well designed fish passages (taking consideration of Guideline 7, Annex IX).**
- **The IMG has recommended that a technical group may be made to study alternatives including the alternative suggested by Prof Bharat Jhunjhunwala that only partial dams across rivers may be allowed. This should happen expeditiously. The proposed projects should be stopped till this is done.**

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A broad conclusion is inescapable that the IMG report (except the dissent note by Shri Rajendra Singh) is largely an exercise in deception, with a pro-hydropower bias. However, the IMG report is not without some positive aspects, though the IMG has been non-serious in applying most of the positive aspects. The MoEF and NGBRA should take prompt action on these positive aspects.

**Kalu Dam in Western Ghats:****Shocking decision by the Forest Advisory Committee**

*Following letter has been sent on April 25, 2013 to the Union Minister of Environment and Forests and also the members of the FAC to review decision to recommendation to give stage 1 forest clearance to Kalu Dam **and not to grant Forest Clearance to Kalu Dam in Maharashtra due to several procedural and legal irregularities on the part of the Project Proponent and also Forest Advisory Committee.. The letter has been sent on behalf of: Indavi Tulpule: Shramik Mukti Sangathana, Murbad, Thane; Affected Villagers of the Kalu Dam, including: Anil Kantaram Kawate: Parchonde (Upsarpanch), Ganpat Deu Mengal: Zadghar (Gram Panchayat Member), Navsu Shiva Wagh: Shisewadi, Mrs. Sonibai Shiva Wagh, Nama Shankar Shida: Banachi wadi, Maloji Alo Mengal: Bhoirwadi, Mrs. Tulibai Wakh: Diwanpada, Bhagawan Bhala: Dighephal, Budjhaji Songwan: Wakalwadi, Anil Waman Wakh: Tejwadi (Phangane), Shivram Lakhu Hilam: Talegaon, Harbhau Raut: Kasole, Popatrao deshmuks: Jadai, Devram Darwade: Khutal, Ashok Pathare: Khutal, Tulshi Bhau Wagh: Zadghar, Moreshwar Bhala: Zadghar, Brian Lobo, Shramik Kastakari Sanagthana: Dahanu, Surekha Dalawi, Shramik Kranti Sangathana: Raigad; Parineeta Dandekar, Himanshu Thakkar, South Asia Network on Dams and People: Pune and Delhi. Excerpts of the letters follow.***

This is to express our utter shock and dismay at FAC's decision of recommending Forest Clearance to Kalu Dam falling in Western Ghats area in Murbad, Thane District, Maharashtra as seen in the minutes of the FAC meeting of April 3-4, 2013.

Just one year ago on the 2<sup>nd</sup> of April 2012, the Forest Advisory Committee had rejected this proposal, raising substantial points against the proposal and closed the file. This was a respite for the communities facing displacement, community groups working on the issue, for the Western Ghats ecology and the forests. We had then thanked FAC for this decision of April 2012.

On 4<sup>th</sup> of April 2013, the same Forest Advisory Committee (now with a changed constitution) went back on its decision and recommended Forest Clearance (FC) to Kalu Dam **even when nothing has changed on ground and all of the objections based on which FC was rejected in the first place still stand today. The Project Proponent (PP): KIDC, Maharashtra Water Resource Department, has not been able to respond in credible way to any of the points raised by the FAC, Chief Conservator of Forests (Central), State Forest Department, affected villagers or civil society organisations.**

**We strongly condemn this decision by the FAC of recommending Forest Clearance for diverting nearly 1000 hectares of Forests in the Western Ghats. We urge you (i) not to recommend FC for**

**Kalu Dam; (ii) request you to take steps to make Forest Advisory Committee more transparent, responsive and accountable to issues of communities and forests; specifically, all the documents**

**from the project proponent, including all the annexures of the Form A and gram sabha resolutions for the projects on FAC agenda must be on FAC website at least ten days in advance as per CIC orders and as also assured by you in public; (iii) We also urge you to direct action against those responsible for il-**

**legal construction of the Kalu dam as noted by the FAC minutes; (iv) urge you ask FAC to hence forth recommend strict action against such violations.**

**Major issues about recommending FC to Kalu Dam:**

**Non-transparent decision making in violation of CIC Orders:** None of the documents submitted by the project proponent about the Kalu Project were available in full with all the annexures on the MoEF website even a week before FAC meeting on the 3<sup>rd</sup> and 4<sup>th</sup> of April. This is a blatant violation of the CIC orders and we had pointed this out to the FAC through our letter dated March 25, 2013, but the FAC chose to ignore this. **As a Minister, you had taken a strong stand against this and had said in October 2012 "These actions and decisions of the officials are unacceptable to me. The forthcoming meeting of the FAC will be postponed, and I shall resolve these (violation of CIC orders and non-compliance of FRA) issues."**<sup>1</sup>

1 [http://articles.timesofindia.indiatimes.com/2012-10-30/developmental-issues/34815971\\_1\\_forest-bureaucracy-clearance-process-forest-advisory-committee](http://articles.timesofindia.indiatimes.com/2012-10-30/developmental-issues/34815971_1_forest-bureaucracy-clearance-process-forest-advisory-committee)

Considering that the lives and livelihoods of about 18000 people will be affected by this project, and when they have the first and foremost right to have all the information on decision making around this project, such irresponsibility on the part of FAC is unacceptable and it is also bad in law. Petition against Kalu Dam is in the High Court of Bombay currently and this point will be raised there.

**Complete reliance on Project Proponent's (PP) claims** While recommending FC, the FAC has relied entirely on claims of the proponent, without checking the veracity of the claims or applying its mind. FAC has

The same proponent has gone back on his word many times earlier and each time, it has been pointed out to the FAC. It has wilfully violated the Forest Act by starting construction of the project in the absence of FC when the project is to submerge nearly 1000 hectares of land in a biodiversity hotspot, it has gone against its written word when it said that 'no new project will be required for Mumbai until 2031', in the process of seeking Stage I Forest Clearance for Shai Project, barely 20 kilometres from Kalu Project.

not even mentioned the numerous submissions made by communities and community-based organisations raising pertinent points against PP's claims. The FAC needed to keep in mind that the same proponent has gone against its word many times earlier and each time, it has been pointed out to the FAC. It has wilfully violated the Forest Act by starting construction of the project in the absence of FC when the project is to submerge nearly 1000 hectares of land in a biodiversity hotspot, it has gone against its written word when it said that 'no new project will be required for Mumbai until 2031', in the process of seeking Stage I Forest Clearance for Shai Project, barely 20 kilometres from Kalu Project.

But the FAC, instead of taking any strict action against the proponent in this regard, has simply accepted its claims, which are again misleading and false.

**Grounds for rejection of Kalu Project in 2<sup>nd</sup> April 2012 by FAC:** The FAC minutes state:

- Submergence of 18 villages and their connectivity,
- Initiation of construction without Forest Clearance,
- Breach of commitment given by the Project Proponent during Stage I clearance of Shai Dam,
- Location of the dam within 7 kms of Protected Area

- Location of the project in eco sensitive Western Ghats
- Non-furnishing of: Rehabilitation Plan, Environment Impact Assessment report, Technical Report on Wildlife Status, Gram Sabha resolutions about compliance of Forest Rights Act

**NONE of the issues stated above are resolved through the PP's responses as clarified below:**

• **No Gram Sabha Resolutions Passed supporting the project: Misleading the Forest Advisory Committee:** PP has claimed that it has secured Gram Sabha Resolutions from 8 villages out of the 11 villages that will be fully or partially submerged by the dam. **In fact, Shramik Mukti Sangathana has letters from 10 Gram Panchayats out of these 11 that they have not issued any such resolutions at any stage.** The last resolution in this regard that they passed was AGAINST the project. These were sent to the FAC on 16.11.11.

If the Project Proponent has the resolutions as claimed, why have they not put these up on the FAC website with the necessary documentation from the PP?

Why did the FAC not see the need to ascertain this even when it was pointed out by us in our letter dated 29.10.12 and again in 25.03.13 that no such resolutions exist?

• **Clear violation of the Forest Conservation Act (1980):** The proponent accepts that it violated the Forest Conservation Act (1980) by starting work before an FC, but states that it stopped AFTER High Court Orders.

High Court Orders were in response of a PIL filed by Shramik Mukti Sangathana against the illegal nature of the work. So, stopping AFTER HC orders is no justification for committing the illegality. Before the High Court orders, Shramik Mukti Sangathana had written several letters about this violation to the Collector, Chief Secretary and Forest Department and had also served a notice to the PP. It did not stop work then.

Considering this, the Forest Advisory Committee ought to have penalised the project proponent for violation of Forest Conservation Act (1980), not recommend the same project for clearance. **This only gives out a signal that**

PP has claimed that it has secured Gram Sabha Resolutions from 8 villages out of the 11 villages that will be fully or partially submerged by the dam. In fact, Shramik Mukti Sangathana has letters from 10 Gram Panchayats out of these 11 that they have not issued any such resolutions at any stage. The last resolution in this regard that they passed was AGAINST the project. These were sent to the FAC on 16.11.11.

no action will be taken by the MoEF even after it knows that violation of Forest Act is happening, that too by a state agency.

• **Continued violation of the Forest Rights Act (2006)** It has been pointed out several times to the FAC that Kalu Project is violating the Forest Rights Act (2006) as community and individual claims are yet to be settled. The Forest Rights Act was passed to safeguard historical injustice on Forest-dependent communities, but the FAC itself is encouraging the PP to violate FRA, PESA, Rehabilitation Policy and Forest Conservation Act. **You as a Minister had reasserted MoEF's commitment to implementation of Forest Rights Act.**

• **No Rehabilitation Plan has been submitted at the time of recommending Forest Clearance** There is no such plan available in public domain, nor has there been any participatory process of approval of the plan with the affected people. A claim of a rehabilitation package of Rs 68.75 Crore does not constitute a Rehabilitation Plan. This point was raised several times by community organisations, State Forest Department, Chief Conservator of Forests as well as the FAC. Villages to be affected by Kalu Dam fall in Tribal Subplan and attract PESA. Without any legally mandatory process, just the claim of rehabilitation package of Rs 68.75 crore seems good enough for FAC. It was clearly wrong on the part of the FAC to recommend FC based on such claims.

• **Konkan Irrigation Development Corporations letter that "it is not necessary to construct any new water source till 2031":** This was submitted to the MoEF while seeking Stage I Forest Clearance for Shai Dam, less than 25 kms from proposed Kalu dam in 2010-11. FAC recommended Stage I Clearance to Shai Dam based on that assurance. In less than 3 years, the proponent feels that Shai dam, whose clearance was obtained on such a claim, will not be sufficient till 2031. This is unjustifiable and tantamount to misleading the FAC with false assurances.

• **No Environment Impact Assessment (EIA) Conducted** The Kalu Dam falls in ecologically sensitive Western Ghats. The Western Ghats Expert Ecology Panel had categorised the region in ESZ I where no large dams should be permitted. Even as per the Kasturirangan Committee Report, more than 5 villages affected by Kalu Dam are falling in the ESA.

The State forest Department, Chief Conservator of Forests (Central), community groups have all urged that EIA as well as a Cumulative Impact Assessment of the Project has to be done before granting Forest Clearance. In fact, this was one of the conditions laid by the State Forest Department. Looking at the ecologically sensitive location of Kalu Dam and submergence of nearly 1000 hectares of Western Ghats Forest Land, this was a reasonable expectation.

Despite these clear conditions, the PP argues that EIA is not required. And despite this, the FAC recommends FC to this project!

In this context, Section 2.3 (ii) of FCA (1980) read, "Notwithstanding the above, if in the opinion of the Ministry or the Advisory Committee, any proposal should be examined from the environmental angle, it may be required that the project proponent refer the case to the Environment Wing of the MOEF." So irrespective of the requirement of EIA notification, the FAC has been provided powers to refer to an such project to the environment wing of MoEF or EAC for examination of the project from the environment angle, but FAC failed to do this just under the claim of the PP that EIA is not required under EIA notification.

FAC recommendation that Cumulative Impact Assessment has to be undertaken for drinking water projects around Mumbai is welcome but again, it could have been done before considering this project for clearance and not after recommending clearance. Similarly their recommendation to the MoEF to amend the EIA notification to ensure that such dams are included for environmental impact assessment is welcome, but they could have waited for MEF response rather than recommending Forest Clearance.

The Kalu Dam falls in ecologically sensitive Western Ghats. The Western Ghats Expert Ecology Panel had categorised the region in ESZ I where no large dams should be permitted. Even as per the Kasturirangan Committee Report, more than 5 villages affected by Kalu Dam are falling in the ESA. The State forest Department, Chief Conservator of Forests (Central), community groups have all urged that EIA as well as a Cumulative Impact Assessment of the Project has to be done before granting Forest Clearance. In fact, this was one of the conditions laid by the State Forest Department. But FAC over ruled all of them and recommended forest clearance to the project.

In this regard we urge you: (i) immediately change the EIA notification to include Kalu and all such large dams under the ambit of the EIA notification, irrespective of the purpose of the project; (ii) Direct specifically that Kalu Dam require EIA and Env clearance, using the above mentioned part of the Forest Conservation Act, 1980 and EPA, 1986; (iii) Order a cumulative impact assessment of all the projects in the western ghats region around Kalu dam, as recommended by FAC and (iv) direct that FC for Kalu will NOT be considered till all these requirements are fulfilled.

• **Forest Conservation Act requires Gram Sabha clearance** Moreover, section 2.1(vii)(4) of the Forest Conservation Act, 1980 clearly states: "Therefore, whenever any proposal for diversion of forest land is submitted, it should be accompanied by a resolution of the 'Aam Sabha' of Gram Panchayat/Local Body of the area endorsing the proposal that the project is in the interest of people living in and around the proposed forest land except in cases wherever consent of the local people in one form or another has been obtained by the State or the project proponents and the same is indicated in the proposal explicitly. However, it would be required where the project activity on forest land is affecting quality of life of the people residing in nearby areas of the site of diversion; like mining projects, displacement of people in submergence area, etc." This provision is particularly applicable to a project like Kalu that has not had EIA or public hearing as stated in the same section in FCA, 1980. Recommending FC for Kalu Dam project without fulfilling this requirement is clearly a violation of the FCA, 1980 by the FAC.

We urge you to direct the project proponent to get gram sabha resolutions on the lines mentioned above in FCA Section 2.1(vii)(4) and direct FAC consider the project only after these have been received.

• **Distance from Protected Area:** The submergence of the project is less than 10 kms from Kalsubai Sanctuary. Considering the fact that no EIA is conducted, no report on Wildlife Status exists, this makes ecological impacts of Kalu Dam on Western Ghats ecosystem even more serious. Considering all these issues, FC should have been rejected on this ground alone. In fact the PP goes ahead to say: "No rare or endangered flora or fauna has been reported from this site" How can this be stated when no EIA has been conducted and no wildlife report exists?

• **The PP states that only "44566" and "44611" that is 'only' 89177 trees will be felled during and the rest 'may be' saved.** Ninety thousand trees in Western Ghats is a huge number. **But it seems FAC does not see any objection in this.** The claim that the rest of the 60 000 trees can be saved is of doubtful credibility. Similarly the claim in the FAC meeting minutes that "No rare or endangered species of flora and fauna has been reported in the area" is also without any credible basis.

• We would like to reiterate that **no options assessment** about water supply options to Mumbai has been done. No consideration of rainwater harvesting, using saline water for some uses, grey water recycling, demand management, water use efficiency, and conjunctive groundwater use has been done. The FAC minutes notes this, but from the minutes it seems it has not applied its mind to these issues and recommended FC as a matter of blind support for the project. The mention of the letter from the Chief Minister in the minutes only adds

to the suspicion that the FAC has cleared the project without looking into merits of the issue.

• **Contradictions in FAC conditions?** The FAC has recommended FC to the project, with some additional conditions, one of the additional conditions states: "The User agency will abide by all conditions by Regional Office, Bhopal and State Government during inspection of the project." So the PP has to adhere to all the conditions imposed by the Regional Office, Bhopal and the State forest Department while inspecting the project.

One of the conditions imposed by the Regional office, Bhopal included: "...the State Govt. **may be directed to stop all the construction related activities till all the legal formalities and forest, wildlife and environment related studies are completed and a well-considered decision regarding forest diversion is taken based on proper scientific documentation and studies.**"

We seem to be in a funny situation now. The FAC, while recommending FC, put a condition that says that decision of FC should not be taken without "proper scientific documentation and studies", but FAC has done just that! **In any case, one implication of this is that the project should not get even first stage FC without the studies recommended by Regional Office, Bhopal, including EIA has been done.**

We seem to be in a funny situation now. The FAC, while recommending FC, put a condition that says that decision of FC should not be taken without "proper scientific documentation and studies", but FAC has done just that! In any case, one implication of this is that the project should not get even first stage FC without the studies recommended by Regional Office, Bhopal, including EIA has been done.

Similarly the State forest department too has asked for (i) Rehabilitation Plan (ii) EIA (iii) technical report from WII on impact of project on wildlife in and around the project area (iv) gram sabha resolutions from all affected villages under FRA. The project should not thus be given even stage I clearance without satisfaction of all these conditions.

Most of these issues have been brought to the attention of the FAC time and again by us, Shramik Mukti Sangathana and other community groups. However, the FAC still went ahead with the incomprehensible decision. Hence, we are writing to you with the hope that after looking at all the points raised above, you will definitely not recommend Forest Clearance to Kalu Dam. We also hope that MoEF will punish violators of FC and FRA Acts to send a strong signal and will take steps to make the present Forest Advisory Committee more transparent, accountable and responsive to issues ailing our forests and forest-dependent communities.

**Lakhwar Dam Project on Yamuna****Why the project should not go ahead**

*This statement was sent to the Union Minister of Environment and Forests, Union Minister of Water Resources, Chairman, Vice Chair and Member (water) of Planning Commission, Uttarakhand Government, and National Advisory Council, among others. The statement was Endorsed by: **Ramaswamy Iyer**, Former Union Water Resources Secretary, Delhi, **E.A.S. Sarma**, Former Union Power Secretary, Vishakhapatnam, **Medha Patkar**, Narmada Bachao Andolan, Badwani, **Ashish Kothari**, Kalpavriksh, Pune, **Rajendra Singh**, Tarun Bharat Sangh, Rajasthan, **Prof. MK Prasad**, Kerala Sastra Sahitya Parishad, Cochin, **Bittu Sahgal**, Editor, Sanctuary Asia, Mumbai, **Prashant Bhushan**, Senior Supreme Court Lawyer, Delhi, **Vandana Shiva**, Navdanya, Delhi, **Amit Bhaduri**, Prof. Emeritus, JNU, Delhi, **Ravi Agarwal**, Toxics Link, New Delhi, **Madhu Bhaduri**, Former Indian Ambassador & member Yamuna Jiye Abhiyaan, Delhi, **Prof S. Janakarajan**, Madras Institute of Development Studies, Chennai, **Dr Dinesh Mishra**, Barh Mukti Abhiyan, Bihar, **Sharad Lele**, Centre for Environment and Development, Bangalore, **S. Faizi** CBD Alliance, Kerala, **Rohit Prajapati**, Paryavaran Suraksha Samiti, Gujarat, **Bharat Jhunjhunwala**, Former Professor-IIM Bengaluru, Uttarakhand, **Vimalbhai**, Matu Jansangthan, Uttarakhand, **E Theophilus**, **Malika Viridi**, Himal Prakriti, Uttarakhand, **Ramnarayan K**, Save the Rivers Campaign Uttarakhand, **Kalyani Menon-Sen**, Feminist Learning Partnerships, Gurgaon, **Dr RK Ranjan**, Citizens Concern for Dams and Development, Manipur, **Jiten Yumnam**, Committee on Natural Resources Protection in Manipur, **Renuka Huidrom**, Centre for Research and Advocacy, Manipur, **Shweta Narayan**, The Other Media, Chennai, **Wilfred Dcosta**, Indian Social Action Forum - INSAF, New Delhi, **Nidhi Agarwal**, Activist, Community rights on environment, Delhi, **Rahul Banerjee**, Dhas Gramin Vikas Kendra, Indore, **Subhadra Khaperde**, Kansari Nu Vadavno, Khargone, **Shankar Tadwal**, Khedut Mazdoor Chetna Sangath, Alirajpur, **Michael Mazgaonkar**, Gujarat, **Ranjan Panda**, Convenor, Water Initiatives Odisha, **M Gopakumar**, Bangalore, **Janak Daftari**, Jal Biradari, Mithi Nadi Sansad, Mumbai, **Shripad Dharmadhikary**, Manthan Ahdyayan Kendra, Pune, **Prof Rohan D'Souza**, Jawaharlal Nehru University, Delhi, **Dr Brij Gopal**, Jaipur, **Alok Agarwal**, Narmada Bachao Andolan & Jan Sangharsh Morch, Madhya Pradesh, **Debi Goenka**, Conservation Action Trust, Mumbai, **Shardul Bajikar**, Editor - Natural History, Saveus Wildlife India, Mumbai **Sankar Ray**, Kolkata, **Samir Mehta**, International Rivers, Mumbai, **V Rukmini Rao**, Gramya Resource Centre for Women, Secunderabad, **Dr. Latha Anantha**, River Research Centre, Kerala, **Mrs Anjali Damania**, Aam Admi Party, Mumbai, **Manshi Asher**, Him Dhara, Himachal Pradesh, **Commodore (rtd) Lokesh Batra**, Social and RTI activist, NOIDA, **Arun Tiwari**, Water activist, Delhi, **Ananda Banerjee**, Writer and member, Yamuna Jiye Abhiyaan, Delhi, **Sudha Mohan**, Yamuna Jiye Abhiyaan, Delhi, **Dr Sitaram Taigor**, Yamuna Jiye Abhiyaan, Madhya Pradesh, **Bhim S Rawat**, Yamuna Jiye Abhiyaan, Delhi, **Prasad Chacko**, Social activist, Ahmedabad, **Swathi Seshadri**, EQUATIONS, Bangalore, **Parineeta Dandekar**, SANDRP, Pune, **Manoj Mishra**, Yamuna Jiye Abhiyaan, Delhi **Himanshu Thakkar**, South Asia Network on Dams, Rivers & People, Delhi*

We the signatories to this statement would like to bring some key issues to the attention of all concerned on the proposed Lakhwar Dam Project on the Yamuna River in Upper Yamuna River Basin in Dehradun district of Uttarakhand state.

The proposed dam involves a massive 204 m high dam with storage capacity of 580 Million Cubic meters, submergence area of 1385.2 ha, including 868.08 ha forest land, at least 50 villages to be affected by submergence of land in the upstream, many more in the downstream area. This site is just about 120 km downstream of the river's origins from the holy shrine of Yamunotri. The composite project involves, in addition to the Lakhwar dam with 300 MW underground power house, another 86 m high Vyasi dam with 2.7 km long tunnel and 120 MW underground power house and a barrage at Katapathar.

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As can be seen from the details below:

- The project has not undergone basic, credible environment or social appraisal in any participatory manner.

- b) It does not have legally valid environment or forest clearance.
- c) There has not been any cumulative impact assessment of various existing, under construction and planned dams and hydro-projects in the Yamuna system.
- d) There has not been any credible assessment about options for the project.
- e) The project is to come up in an area that is seismically active, prone to flash floods and also prone to erosion and land slides.
- f) The spillway capacity of the project has been awfully underestimated resulting in significant risks of dam damage / breakage with concomitant risks of unprecedented downstream flooding and destruction. It may be mentioned here that Delhi is a major city standing in the path of the river in the downstream area.
- g) The religious and spiritual importance of the Yamuna River is at risk since whatever remains of the river will be completely destroyed both in the upstream and downstream of the project.
- h) No agreement exists among the Upper Yamuna basin states about sharing of costs and benefits of the project, which should be a pre-condition for taking up any such project.
- i) It is well known that Yamuna River is already one of the most threatened rivers in the country and the project shall further adversely affect the river system.

Recently as well as earlier last year thousands of people from Allahabad/Vrindavan marched to Delhi, seeking a revival of their river Yamuna. The focus of the authorities should be on ways and means to restore the river Yamuna system rather than take such massive project without even basic appraisal.

We thus urge the official agencies at both the state and at the centre level to not go ahead with this project. We urge them to rather take steps to protect and preserve than destroy one of the biggest and culturally important river, without even basic appraisal at project or basin level or any options assessment carried out in a due participatory manner.

We hope that the government will not go ahead with this project until all the issues mentioned have been satisfactorily resolved.

We urge the official agencies at both the state and at the centre to not go ahead with this project. We urge them to rather take steps to protect and preserve than destroy one of the biggest and culturally important river, without even basic appraisal at project or basin level or any options assessment carried out in a due participatory manner.

## DETAILED NOTES

**1. No Options Assessment** There has been no assessment to show that this project is the best option available for the services that it is supposed to provide, including water supply to Delhi, irrigation in Uttarakhand, hydropower generation and water storage. It was not done during the process preceding the now out-dated environmental clearance given in 1986, nor has it been done subsequently.

It is well known that Delhi has much cheaper, environment friendly and local options that has not been explored with any sense of seriousness. These include reduction in transmission & distribution losses (which stand at 35%), rainwater harvesting (as National Green Tribunal order in April 2013 exposed, even the Delhi Metro is not doing this) including groundwater recharge, demand side management, stopping non essential water use, protection of local water bodies, protection of flood plains, streams and the ridge, recycle and reuse of treated sewage, among others.

As far as irrigation in Uttarakhand is concerned, in this relatively high rainfall area, and considering the local agro-geo-climatic situation and suitable cropping patterns, better options exist. Similarly about other claimed services.

It may be added here that the EIA manual of Union Ministry of Environment & Forests, the National Water Policy and best practices around the world including the recommendations of the World Commission on Dams, require such an options assessment study, including no project scenario, before embarking on such costly and risky projects.

**2. No Basin wide cumulative impact assessment or basin study:** Yamuna River is already in very bad situation in many senses, including being very polluted for lack of surface water flow. The river basin also has large number of projects existing and under

construction, See: [http://www.sandrp.in/basin\\_maps/Major\\_Hydro\\_Projects\\_in\\_Yamuna\\_Basin.pdf](http://www.sandrp.in/basin_maps/Major_Hydro_Projects_in_Yamuna_Basin.pdf), for details. Particularly, see the concentration of projects in narrow upper Yamuna Basin. However, there has been no basin wide cumulative impact assessment of projects and water use in the basin in the context of its carrying capacity on various aspects. Without such an assessment, adding more projects may not only be unsustainable, it may actually be worse than zero sum game, since the new projects will have large number of adverse impacts. That we may have already crossed the basin carrying capacity upstream of Delhi seems evident from

the worsening state of Yamuna over the past decades in spite of investment of thousands of crores rupees. Adding this project with its massive impacts without such an assessment may actually be an invitation to disaster.

We learn that a Yamuna basin study has been assigned to the Indian Council for Forestry Research and Education (Dehradun). However, it should be noted that in the first place, ICFRE has had poor track record. Its EIA study for the Renuka dam in the same Yamuna basin was so poor that it was based on the poor quality of the study that the National Green Tribunal stayed the work on the project for over a year now.

### 3. No valid environment clearance, no valid EIA-EMP or Public consultation process

The Composite Lakhwar Vyasi project got environment clearance 27 years back in 1986 without any comprehensive environment impact assessment (EIA) or preparation of environment management plan (EMP) or any participatory process. Some preliminary work started, continued only till 1992 and stopped thereafter for lack of funds.

a) In Sept 2007, the 120 MW Vyasi HEP, part of the original composite project, sought and got environment clearance although the minutes of the Expert Appraisal Committee of MoEF notes a number of unresolved issues. In Nov 2010 EAC meeting, the EAC considered the Lakhwar Dam for Env clearance, and raised a number of questions, none of them were ever resolved. The EAC did not consider the project in any meeting after Nov 2010.

This sequence of events makes it clear that Lakhwar Dam does not have valid environment clearance. The MoEF and project proponent assumption that the Environment Clearance (EC) of 1986 is valid is not correct, since if that EC was not valid for the Vyasi HEP which has sought and received fresh EC in Sept 2007, then how could Lakhwar HEP Dam of which Vyasi HEP is a part, continue to possess a valid EC.

Thus to give investment clearance to Lakhwar dam without valid EC will be imprudent, and might invite long drawn legal challenge to the project, resulting in more delays and in turn unnecessary cost escalations.

Delhi has much cheaper, environment friendly and local options that have not been explored with any sense of seriousness. These include reduction in transmission & distribution losses (which stand at 35%), rainwater harvesting (as National Green Tribunal order in April 2013 exposed, even the Delhi Metro is not doing this) including groundwater recharge, demand side management, stopping non essential water use, protection of local water bodies, protection of flood plains, streams and the ridge, recycle and reuse of treated sewage, among others.

b) The project also does not have valid EIA-EMP. What ever assessments were done before the 1986 EC cannot be considered adequate or valid today. The environment standards and also environment situation has hugely changed in the intervening 27 years.

The project did not have any public consultation process in 1986 or anytime there after. Fresh EC will require that and the project must go through that process.

**4. Issues raised by EAC remain unresolved:** When the 43<sup>rd</sup> meeting of EAC considered the project for EC on Nov 12-13, 2010, the minutes of the meeting raised a large number of questions, all of them remain unresolved.

These issues are fundamental in nature. Without resolving these issues, the project should not go ahead.

Just to illustrate, EAC raised questions about the need and usefulness of various project components. It is clear from the EAC minutes that the project also involves construction of Katapathar barrage downstream from Vyasi Power House at Hatiari. However, just about 10 km downstream from this barrage there is an existing barrage at Dak Pathar. It is not clear why this Katapathar barrage is required, the EAC asked. None of these issues have been resolved.

**5. Project does not have valid forest clearance:** The composite Lakhwar Vyasi project requires a very large area of forest land, at 868.08 ha, the diversion was originally permitted for the UP irrigation Dept, which was then transferred to Uttaranchal Irrigation Dept upon creation of the separate Uttaranchal State. However, the project has now been transferred to Uttaranchal Jal Vidyut Nigam Limited. The Vyasi Project was earlier transferred to NHPC and now stands transferred to UJVNL.

In Aug 2012 FAC (Forest Advisory Committee is a statutory body under the Forest Conservation Act 1980) meeting, there was a proposal put forward to transfer the clearance for 99.93 ha (out of total forest land of Rs 868.08 ha for composite project) forest land required only for the Vyasi Project to UJVNL from Uttaranchal Irrigation Dept. While discussing this proposal, FAC noted that the Vyasi project was earlier transferred NHPC, without getting the forest clearance transferred in favour of NHPC. In fact FAC has recommended, "State Govt shall examine the reasons for not obtaining prior approval of the Central Govt under the Forest (Conserva-

tion) Act, 1980, for change of user agency from irrigation dept to NHPC and fix responsibility". Secondly what is apparent from the minutes of the Aug 2012 FAC meeting is that even the Catchment Area Treatment Plan for the Vyasi project has not yet been prepared. This shocking state of lack of preparation of basic management plan is the consequence of allowing the project based on outdated clearances. The FAC has now asked the user agency to fulfil all such requirements, before which the project will not be given stage II forest clearance. So the Vyasi Project also so far does not have stage II forest clearance.

Most importantly, the transfer of forest clearance for the remaining 768.15 ha of forest land required for the Lakhwar project from Uttarakhand irrigation dept to the current project agency UJVNL has not been even sought. So the Lakhwar project does not have valid forest clearance even for first stage, and surely no stage II forest clearance. Under the circumstances, the project does not have legal sanction.

**6. Inadequate spillway capacity** The project spillway capacity is proposed to be of 8000 cumecs, as per official website, see: [http://india-wris.nrsc.gov.in/wrpinfo/index.php?title=Lakhwar\\_D00723](http://india-wris.nrsc.gov.in/wrpinfo/index.php?title=Lakhwar_D00723). However, as per the latest estimates, the location is likely to experience probable Maximum Flood of 18000 cumecs. This is as per a paper titled "**The probable maximum flood at the Ukai and Lakhwar dam sites in India**" by P R Rakhecha and C Clark, presented in the year 2000 at an international Symposium. Dr Rakhecha later joined Govt of India's Indian Institute of Tropical Meteorology in Pune. The paper concludes: "For the Lakhwar dam site there would be significant flow over the dam crest after 12 h from the start of the storm hydrograph and this would be maintained for over 18 h. The maximum depth of flow over the crest would be 4 m which is large enough to cause major if not catastrophic damage to the dam structure."

Thus the spillway capacity of the project needs to be reviewed and it would not be prudent to go ahead without the same as the new PMF could cause major damage to the dam, the paper says. Any damage to this massive structure will have far reaching consequences all along the downstream area, right upto Delhi and downstream.

In fact even for the Vyasi HEP, while discussing the project in the EAC meeting of Aug 16, 2007, the minutes notes that the clarification sought by EAC on Dam Break Analysis for the project is incomplete, inadequate and far from satisfactory and the EAC desired further

concurrence of Central Water Commission. In fact, EAC should not have recommended EC to the Vyasi Project with a flawed study. For the bigger Lakhwar project, there has not even been any such appraisal.

**7. No agreement among Upper Yamuna basin states, Unresolved disputes** The Lakhwar storage project is part of the Upper Yamuna basin. An inter-state agreement was arrived at in 1994 for sharing of water in the Upper Yamuna basin among the basin states of Himachal Pradesh, Uttar Pradesh (now also Uttarakhand), Haryana, Delhi and Rajasthan. Each

project under the agreement required separate agreements. However, there has been no agreement on sharing the costs and benefits of the individual projects under the agreement.

On Renuka project also in the same Upper Yamuna basin, there was an agree-

ment that was arrived at in 1994, but the Ministry of Law has said that the agreement is no longer valid. For several years now the Upper Yamuna River Basin Board has been holding meetings, but has failed to arrive at any agreement for sharing the costs and benefits of Renuka dam. For Lakhwar dam there has been not been any serious attempt in that direction. The current project proposal envisages to provide 50% of water (about 165 MCM) to Delhi and 50% to Uttarakhand for irrigation (see: [http://www.business-standard.com/article/companies/work-on-300-mw-lakhwar-project-to-begin-by-aug-112062200178\\_1.html](http://www.business-standard.com/article/companies/work-on-300-mw-lakhwar-project-to-begin-by-aug-112062200178_1.html) dated June 22, 2012 includes statement from project proponent UJVNL (Uttarakhand Jal Vidyut Nigam Ltd) Chairman). However, this proposal completely ignores the claims of share from the project by Uttar Pradesh, Haryana, Rajasthan and Himachal Pradesh. To go ahead with the project without an inter state agreement on sharing costs and benefits would surely not be prudent.

**8. Inadequate cost estimates** As per estimate as on March 1996 the cost of the project is Rs 1446 crore out of which Rs 227 crore have been spent (see: official website [http://uttarakhandirrigation.com/lakhwar\\_vyasi\\_project.html](http://uttarakhandirrigation.com/lakhwar_vyasi_project.html)). Note that this cost was for the composite project, including Vyasi HEP. As per UJVNL official website <http://www.uttarakhandjalvidyut.com/lakhwar.php>, the cost of Lakhwar Project alone is Rs 4620.48 crore on Feb 2010. The same site gives the cost of Vyasi HEP at Rs 1010.89 crores, so the cost of combined project at Feb 2010 PL is Rs 5631.37 crores. The cost has thus seen 300% escalation in 14 years between 1996 and 2010.

A Yamuna basin study has been assigned to the Indian Council for Forestry Research and Education (Dehradun). However, ICFRE has poor track record. It's EIA study for the Renuka dam in the same Yamuna basin was so poor that it was because of the poor quality of the study that the National Green Tribunal stayed the work on the project for over a year now.

*Continued on page 23 ....*

## How efficient is Maharashtra's Sugarcane crop?

That question may sound slightly irreverent and irrelevant.

Maharashtra is the highest sugar producing state of India. Its sugarcane yield in 2011-12 was 80.1 t/ha, compared to the yield of 59.6 t/ha for the second highest sugar producing state Uttar Pradesh and national average of 70.3 t/ha. The average sugar recovery rate of the four sugarcane cultivation methods in Maharashtra was 11.32% in 2011-12, the recovery rate of Adsali sugarcane was even higher at 12.3%. The Maharashtra average was way above that of UP at 9.16% and all India rate of 10.2%. In fact the land productivity adjusted for recovery rate is even higher for Maharashtra at 98.8 t/ha (161.14 t/ha for Adsali) compared to 61.04 t/ha for UP. The yield per month when adjusted for recovery rate is 7.56 t/ha/month compared to 6.33 t/ha/month for UP.

So with the highest production, high yield and high recovery rate, there should be no question of efficiency of Maharashtra sugarcane crop.

**Indeed.**

### Methods of Sugarcane cultivation in Maharashtra

Let us understand the basic parameters of how sugarcane crop is grown in Maharashtra, see the table below.

Of the four sugarcane cultivation methods prevalent in Maharashtra, Ratoon is most popular with 40% cane area under it, possibly since it has shortest duration at 11 months, fitting almost perfectly with the annual Oct to March cane crushing season. Same can be said about Suru

method, having duration of 12 months and coverage of 20%, both methods requiring 22.5 irrigations, each of 7.5 cm depth. Adsali method has the highest yield and recovery rate, but only 10% of the sugarcane area is under this method, possibly since it has the longest duration at 17 months. It is most water intensive, requiring 32.5 irrigations. Pre-seasonal method, as the name suggests, is planted about 2.5 months before the season, and stands between Ratoon and Adsali in terms of duration, yield and recovery rate.

### Water Productivity The latest report from CACP

from which the above figures are taken, however states that land productivity alone does not give correct picture, "...as land and water are increasingly becoming scarce in India with high opportunity costs. Therefore, the real resource cost of growing sugarcane in different regions cannot be correctly compared unless land productivity is normalised for the time duration of crop, its water intake, and its recovery rate." To make such a comparison, CACP made a table, a part of which is given above in Table 1.

However, CACP has gone a step further than the figures in Table 1 (though there is an error in CACP calculations here, we have pointed this out to CACP). CACP has calculated water productivity of different sugarcane methods in Maharashtra and compared them with the water productivity in UP. The average water productivity of sugarcane in Maharashtra comes to 0.403 T/ha/month/000 m<sup>3</sup> water, compared to 1.11 for UP. This means that while UP seemed inefficient in sugarcane productivity in everyway, Maharashtra is inefficient by 175.43% when productivity per unit of water consumption is considered.

### Basic parameters of sugarcane crop in Maharashtra in 2011-12

Method	% share	Production (lakh T)	Yield (t/ha)	No of std irrigations (7.5 cms)	Water requirement, '000 m <sup>3</sup> /ha	% recovery rate	Yield adjusted for recovery rate t/ha	Crop duration, months	Yield t/month adjusted for recovery rate
Adsali	10	122.64	120	32.5	24.38	12.30	161.14	17.00	9.48
Pre-seasonal	30	275.94	90	27.5	20.63	12.00	117.9	14.50	8.13
Suru	20	143.08	70	22.5	16.88	11.45	87.50	12.00	7.29
Ratoon	40	276.94	65	22.5	16.88	10.50	74.51	11.00	6.77
Total/weighted average	100	818.60	80	25	18.75	11.32	98.79	12.85	7.56

Source: Price Policy for Sugarcane: the 2013-14 Sugar season, Commission for Agricultural Costs and Prices, Ministry of Agriculture, Government of India, Aug 2012, Table 5.1

How is this possible? The reason why sugarcane productivity of UP in terms of water is higher is simple: UP sugarcane crop is of shorter 9-10 months duration and requires only 7-8 irrigations, approximately less than once a month. As against this, Maharashtra sugarcane crop requires irrigation every 15 days and that too for longer duration. To put it another way, while on average Maharashtra needs 25 irrigations for sugarcane crop, UP needs 7.6.

CACP: "...as land and water are increasingly becoming scarce in India with high opportunity costs. Therefore, the real resource cost of growing sugarcane in different regions cannot be correctly compared unless land productivity is normalised for the time duration of crop, its water intake, and its recovery rate."

**Water required per kg of sugar** The CACP report further calculates that in Maharashtra every kilogram of sugar needs 2068 litres of water, where as in UP the requirement is almost half, at 1044 litres. This is indeed a telling figure. Add to it, as CACP report puts it, "real cost of water in Maharashtra is at least 2 to 3 times higher than that in UP".

In response to a specific question, CACP chairman Dr Ashok Gulati wrote to me that this water calculation does not include the water used by sugar mills, nor the water losses from the source to the farm. If water used by sugar mills and water used in further downstream processing and water losses from the source to the farm are included, the water consumption in sugar production is will go up substantially.

This analysis is very relevant for a state like Maharashtra that has much lower rainfall and per capita water availability compared to northern states like UP and Bihar. It is even more relevant when 79.5% of Maharashtra's sugarcane is grown in drought prone districts as we showed in another blog.

**How sugar mills lock up Maharashtra's water future** Considering water consumption becomes even more important, looking at the kind of impact sugarcane cultivation is having in Maharashtra this drought season. Here it may be recalled that sugarcane is a long duration trans-season crop that has implications for water consumption beyond the point where decision for planting is taken. So even if the rainfall is normal or above when the crop is planted, the same crop will continue to have high water demand in the following year when it may be drought year. This creates really serious implications for water availability in the drought year particularly in drought prone, low rainfall areas. The impact on water available becomes even more serious in a state like Maharashtra where sugar mills are set up

The average water productivity of sugarcane in Maharashtra comes to 0.403 T/ha/month/000 m<sup>3</sup> water, compared to 1.11 for UP. This means that while UP seemed inefficient in sugarcane productivity in everyway, Maharashtra is inefficient by 175.43 % when productivity per unit of water consumption is considered.

irrespective of water availability, violating the norms of distances, where sugar factories operate at way beyond their sanctioned capacity, where they violate the norms of no more than 5% of cultivable land under sugarcane, they dump untreated effluents into water bodies, thus polluting the water in such water bodies and so on. The lock in becomes even more stronger with the setting up of sugar mills, since their owners would like to get maximum cane every year, irrespective of water availability situation.

The CACP report says Maharashtra is further worse off in terms of cost of providing water for sugarcane, "If this costing is included in calculating water productivity, the difference in sugarcane yields will be so high that, Uttar Pradesh and presumably Bihar, would turn out to be the most efficient producers of sugar per unit cost of water, adjusted for time duration and recovery." CACP goes on to say that Maharashtra sugarcane grown on 3% of the total cropped area of the state, takes away 60% of irrigation water in the state, "leading to massive inequity in the use of water within the state". These figures might be slightly outdated considering the expansion of sugar factories and sugarcane cultivation in recent years.

**Band aid solutions won't help** One recommendation CACP report makes for Maharashtra is that much of sugarcane in the state must be brought under drip. Even

The CACP report says Maharashtra is further worse off in terms of cost of providing water for sugarcane, "If this costing is included in calculating water productivity, the difference in sugarcane yields will be so high that, Uttar Pradesh and presumably Bihar, would turn out to be the most efficient producers of sugar per unit cost of water, adjusted for time duration and recovery."

the Chief Minister of State and the Union Agricultural Minister has made same recommendation. We are not sure if this is really a solution since this is unlikely to curb the unsustainable levels of sugarcane in drought prone districts of Maharashtra, considering the politics involved in the issue with large number of politicians owning sugar factories.

As per the Maharashtra Economic Survey figures for last two years, Maharashtra has provided subsidy for drip irrigation in 5.68 lakh ha and for sprinkler irrigation in 2.33 lakh ha between 2005-06 and 2011-12, thus providing subsidy for covering 8.01 lakh ha for these two techniques in these seven years. However, we see no impact of so much area under the drip and sprinkler irrigation on water situation in the state, nor do we see much of sugarcane under drip. State institute like the Vasantdada Sugar Institute does not even know how much sugarcane is under drip even though it has a section just for drip irrigation. More investment in drip for sugarcane is likely to give reasons for expansion of sugarcane empire in drought prone districts, in addition to opening the doors for more corruption.

Another method called Sustainable Sugarcane Initiative can help the farmers to produce at least 20 per cent more sugarcane, and that too with 30 per cent of reduced water consumption and 20 per cent less chemical inputs. CACP report though, is silent on this.

However, options like drip irrigation and sustainable sugarcane initiative should be explored for sugarcane cultivation in relatively water rich areas. However, in immediate future, Maharashtra needs to cancel all new licenses for sugar mills and put a halt to new mills and expansion of existing sugar mills in drought prone districts. For existing sugar factories, it needs to decide the level of sustainable sugarcane cultivation in each drought prone district through a transparent, independent process. Immediately in this drought year, no more water should be allowed to be used for sugarcane cultivation in drought prone districts.

Maharashtra has very challenging water future even if all these steps are implemented. Its water future is very bleak if no serious move is made in this direction.

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2. *How is 2012-13 Maharashtra Drought worse than the one in 1972?*, March 2013, SANDRP, <http://sandrp.wordpress.com/2013/03/30/how-is-2012-13-maharashtra-drought-worse-than-the-one-in-1972/>
3. Economic Survey for Maharashtra for 2011-12 and 2012-13
4. *Sugarcane leaves farmers crushed*, Business Line, April 15, 2013  
<http://www.thehindubusinessline.com/opinion/sugarcane-leaves-farmers-crushed/article4620505.ece>

..... continued from page 20

This is a very costly project and the cost is likely to be even higher at current prices. In any case, the estimate should be for current price level and the cost benefit calculations should also be for the latest date.

**9. Seismically active area, erosion prone landscape:** The project area is seismically active, flash flood, land slides, cloud bursts and erosion prone. In the context of changing climate, all these factors are likely to be further accentuated. When the project was first proposed in mid 1980s, none of these issues as also the issues of biodiversity conservation, need to conserve forests for local adaptation, forest rights compliance, environment flows etc were seen as relevant or important. However, all of these issues are important today. The project clearly needs to be re-appraised keeping all these issues in mind.

The project spillway capacity is proposed to be of 8000 cumecs, as per official website. However, as per the latest estimates, the location is likely to experience probable Maximum Flood of 18000 cumecs, as per a research paper. The paper concludes: "The maximum depth of flow over the crest would be 4 m which is large enough to cause major damage to the dam structure." Thus the spillway capacity of the project needs to be reviewed and it would not be prudent to go ahead without the same.

**10. No CEA clearance** All large hydropower projects require concurrence of Central Electricity Authority as per the Electricity Act of 2003. The Lakhwar Project has not yet received the clearance from CEA, hence, there should be no case for investment clearance for the project.

Moreover, according to the opening sentence of the CEA clearance letter of Oct 25, 2011 for the 120 MW Vyasi Project, which was earlier part of the composite Lakhwar Vyasi Project, but is now being taken up separately, the total installed capacity of the composite project is 540 MW, out of which, since Vyasi installed capacity is 120 MW as per this concurrence letter, the capacity of the Lakhwar dam ALONE would be 420 MW. Note that this is as per the statutory letter from CEA, India's highest technical body in electricity sector. However, the installed capacity of the Lakhwar dam according to all other available information, including official websites of UJVNL and Uttarakhand Irrigation Dept (the original project developer) and also EAC minutes, is 300 MW. So there is an additional confusion as to what is the planned installed capacity of Lakhwar project. This confusion also needs resolution.

## Why Solapur, Sugarcane and Sustainability do not rhyme?

As I build this dam  
I bury my life.  
The dawn breaks  
There is no flour in the grinding stone.

I collect yesterday's husk for today's meal  
The sun rises  
And my spirit sinks.  
Hiding my baby under a basket  
And hiding my tears  
I go to build the dam

The dam is ready  
It feeds their sugarcane fields  
Making their crop lush and juicy  
But I walk miles through forests  
In search of a drop of drinking water  
I water the vegetation with drops of my sweat  
As dry leaves drop and fill my parched yard

**Daya Pawar<sup>1</sup>** (Original marathi song *Bai me dharan bandhte, majha maran kandte*)

**Table 1: Taluka wise Rainfall in Solapur district in 2012 monsoon (June-Oct)**

Taluka Name	Normal Rain (mm)	Actual Rain (mm)	% To Normal
N. Solapur	617.3	465.4	75
S. Solapur	617.3	465.4	75
Barshi	596.5	551.8	93
Akkalkot	676.3	556.3	82
Mohal	573.9	316.4	55
Madha	534.4	435.5	81
Karmala	544	272.6	50
Pandharpur	573.7	360.4	63
Sangola	462.4	393.6	85
Malshiras	441.3	308.3	70
Mangalwedha	519.8	402.9	78
Solapur	559.7	412	74

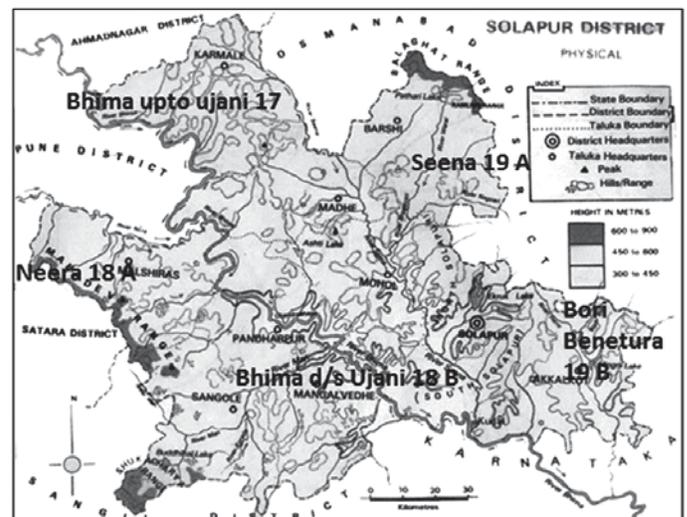
The 2012-13 sugarcane crushing season (which goes on for 160 days<sup>2</sup> from roughly 15<sup>th</sup> October) has concluded. It may be instructive to look at the figures of the sugarcane crushed by sugar factories in Solapur, one of the worst drought-hit districts in the state (taluka wise rainfall in Solapur district is given in table 1).

During 2012-13 (latest crushing figures as on 11<sup>th</sup> April 2013), 126.25 Lakh tonnes cane was crushed in Solapur district alone in its 28 sugar factories<sup>3</sup>. Just for reality check, we should add that normal monsoon (June-Oct) rainfall in the district is 560 mm, in 2012 monsoon the rainfall was 412 mm, see table below for taluka wise rainfall in the district during June-Oct 2012 monsoon in Solapur district (source: <http://www.mahaagri.gov.in/rainfall/index.asp>).

Solapur seems to have the highest number of sugar factories in Maharashtra. The district accounts 18.25% of the cane crushed in the state during 2012-13. In 2012-13, a year that was called as a 'drought year, worse than 1972 drought', Solapur added 4 new sugar factories.

**River basins of Solapur** The Solapur district belongs to five different sub basins as described by the Maharashtra Water and Irrigation Commission Report (June 1999), see details in accompanying map and Table 2. Among these five sub basins, the Maharashtra Water

and Irrigation Commission report describes sub basins 18B, 19A and 19B as highly deficient considering the water availability from all natural sources. We can see from table 2 that 86.6% of Solapur district, barring parts of Karmala and Malshiras talukas, fall in this *highly deficient river basins*. The Commission says about these sub-basins: "It is desirable to impose a total ban on water intensive crops like sugarcane in these deficit sub basins". In these sub basins, "less water intensive crops only" and



1 From Staying Alive: Women, Ecology and Development, Zed books, Vandana Shiva, 1988

2 Vasant Dada Sugar Institute Magazine DnyanYaag 2012

3 Sugar Commission Maharashtra: Crushing Figures as on 11th April 2013

Table 2 Sub basin wise area of Solapur district

(Area in sq km)

Sub basin No	Sub Basin Name	Talukas of Solapur in the sub basin (area of the taluka in sub-basin)	Area of Solapur in the sub-basin	Solapur area in the sub basin as % of sub basin area
17	Bhima upto Ujani	Karmala (930)	930	6.32%
18 A	Remaining Bhima NEERA	Malshiras (1065)	1065	15.2%
18 B	D/s of Ujani including Man	Malshiras (457) + Sangola (1550) + Pandharpur (1304) + Madha (813) + Mohol (565) + S Solapur (146) + Mangalwedha (1141)	5976	57.3%
19 A	Sina	Madha (732) + Mohol (843) + S Solapur (718) + Akkalkot (80) + N Solapur (736) + Barshi (1483) + Karmala (680)	5272	41.37%
19 B	Bori-Benetura	Akkalkot (1310) + S Solapur (331)	1641	43.9%
	<b>TOTAL</b>		<b>14884</b>	<b>--</b>

**Note:** Information from Maharashtra Water and Irrigation Commission, numbers in first column as per the same report; taluka wise area figures following <http://solapur.nic.in>

“less water intensive economic activities only” should be permitted, says the commission (p 138, Vol. III).

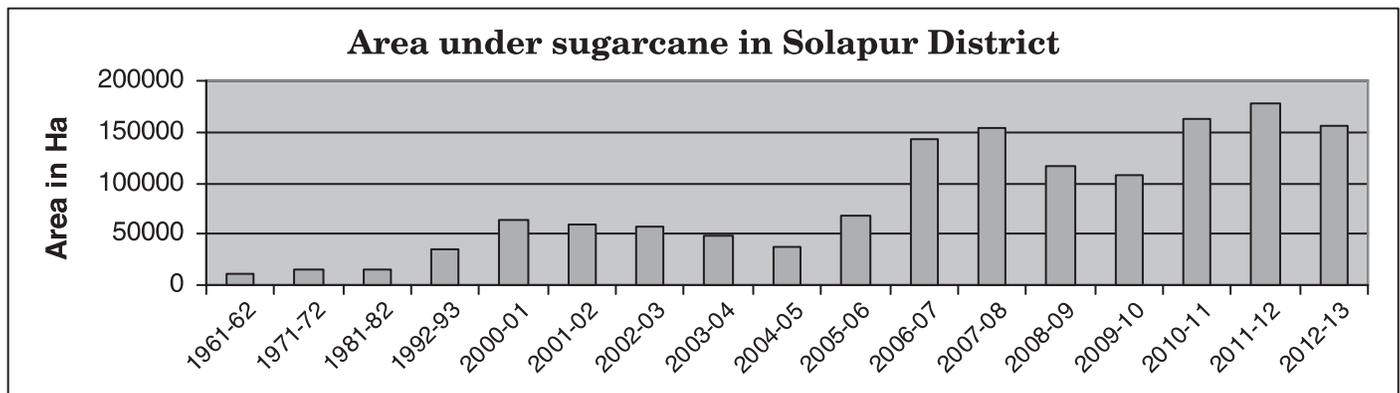
It means that sugarcane crop and sugar factories in all talukas of Solapur district, possibly except those in Karmala and Malshiras are unviable, in violation of the MWIC report and against prudent water management. There is some addition to the water available in these basins (18B, 19A and 19B) following implementation of Ujani dam and inter-basin transfers. However, that still does not justify any crops like sugarcane or setting up of sugar factories. MWIC clears states that additional water should be spread across the talukas to benefit maximum farmers. Sugarcane cultivation clearly won't help that cause.

#### Rise of sugarcane cultivation in Solapur

“Sugarcane is a crop which exhausts the soil and, therefore, it is not grown in the same field from year to year but is rotated in alternate years with food-crops.”

District Gazetteer of Sholapur, 1977<sup>4</sup>

How rapidly the area under sugarcane in Solapur district has gone up can be seen from the graph (figures from official sources like <http://mahaagri.gov.in> and Sugar Commissionarate in Pune, 1961-62 and 1971-72 figures is from the Solapur district gazetteer and for 1992-93 from MWIC report). It is clear from the graph



<sup>4</sup> [http://solapur.gov.in/htmldocs/1977/agri\\_irrigation.html](http://solapur.gov.in/htmldocs/1977/agri_irrigation.html)

that the sugarcane area approximately doubled in Solapur during seventies and again during the eighties. Between 2005-06 and 2011-12, it seems to have gone up by over 160%, this is the highest growth phase for sugarcane cultivation in Solapur. That growth phase is likely to continue if we go by the number of new sugar factories that are planned to be set up in Solapur.

The area under sugarcane in Solapur at its high in recent years was 1.79 lakh ha in 2011-12, which is 19.46 % of net sown area of 9.2 lakh ha in the district (see table 3 below). Of the net irrigated area of 2.52 ha in Solapur, sugarcane take away 71.03%, way above the prudent 5% prescribed in Maharashtra. It is clear that sugarcane has been taking away disproportionate share of water of the district, at the cost of the rest of the farmers.

**Table 3: Profile of Solapur district<sup>5</sup>**

Area in '000 ha		Solapur
Geographical area		1487.8
Sown area		919.7
Net Irrigated area		251.5
Canal irrigated area		31.4
GW irrigated		193.5
Sugarcane area	2007-08	154.5
	2010-11	163.1

The area under sugarcane in 2012-13 consumed about 2630 MCM water. Assuming a rather high irrigation efficiency of 60% (considering that most of the water comes from surface water sources) water required from source would be 4383 MCM<sup>6</sup>.

In addition, the sugar mills consumed at least 19 MCM water, total coming to 4402 MCM water. According to MWIC report, even with maximum possible augmentation (from all planned schemes, many of which are not even implemented or sanctioned), Solapur district's total share of water is 4188 MCM. But the current level of sugarcane cultivation in Solapur already seems to be using more water than the ultimate planned water allocation for Solapur.

**New Sugar factories planned in Solapur!** To add to this, at least 19 new sugar factories (see details in Table 4) are planned in Solapur<sup>7</sup>. *Sakhar Diary 2013* gives the

During 2012-13 (latest crushing figures), 126.25 Lakh tonnes cane was crushed in Solapur district in its 28 sugar factories. The normal monsoon (June-Oct) rainfall in the drought prone district is 560 mm, in 2012 monsoon the rainfall was 412 mm. Solapur seems to have the highest number of sugar factories in Maharashtra. The district accounts 18.25% of the cane crushed in the state during 2012-13. In 2012-13, a year that was called as a 'drought year, worse than 1972 drought', Solapur added 4 new sugar factories.

locations and capacities of these factories. Some of these factories have also received distance certificates<sup>8</sup> from the Sugar Commissioner's office, Maharashtra indicating that they are at an advanced clearance stage at the state level. Together, these new factories will add crushing capacity of 85.52 Lakh tonnes of sugarcane. Madha, part of the constituency of Union Agriculture minister Sharad Pawar, is in the forefront of getting new sugar factories.

To grow this 85.52 L T sugarcane, an additional 105 580 hectares will have to be brought under sugarcane cultivation. Additional 1782 MCM of water will be required at farm to cultivate this sugarcane. Assuming even a high irrigation efficiency of 60%, this would mean requirement of 2970 MCM water at source. In addition, the Sugar factories will require 12.83 MCM of water for crushing this cane.

The new planned sugar factories will bring total area under sugarcane in Solapur to 2.685 lakh ha and the annual water consumption by sugarcane and sugar mills over 7400 MCM. This is way above the full planned allocation of water for Solapur as per the MWIC report.

MWIC assessment is exhaustive including all possible planned water schemes, so there is no possibility for Solapur to get water over and above the ultimate planned schemes in Solapur. This means that by going for these new sugar factories, Solapur would possibly taking water of other regions or accelerating towards rapid exhaustion of its available groundwater.

Similar situation prevails in Osmanabad, Beed, Jalna, Parbhani in Marathwada which are reeling under severe drought and where drinking water itself has be-

5 <http://agricoop.nic.in/Agriculture%20Contingency%20Plan/Maharashtra/MH1-Solapur%203.2.2011.pdf>

6 CACP chairman Prof Gulati clarified to us through email on April 21, 2013, the water requirement per Tonne sugarcane produced, as given in the CACP report is calculated at farm and the irrigation efficiency would depend on the source.

7 Sakhar Diary 2013, a leading reference book for sugarcane cultivators and factories in Maharashtra

8 Certifying that the new factory locations are 25 km or more from the nearest existing sugar factories, as per the Dec 2012 notification from Govt of India.

Table 4: Taluka wise crushing capacities of existing and proposed sugar factories in Solapur

(crushing capacity in T/day)

Taluka	Existing sugar factories		Planned sugar factories	
	Number of Factories <sup>9</sup>	Crushing Capacity	Number of Factories <sup>10</sup>	Crushing Capacity
Madha	3	11000	5	15000
Mohol	3	7500	1	2500
Karmala	3	6250	2	5000
Malshiras	5	19500	--	--
Akkalkot	2	6000	2	5000
Barshi	2	5000	1	2500
Mangalvedha	1	2500	3	9950
Pandharpur	4	12500	--	--
Sangola	1	2500	1	2500
North Solapur	3	10000	1	2500
South Solapur	1	2500	3	8500
<b>TOTAL</b>	<b>28</b>	<b>85250</b>	<b>19</b>	<b>53450</b>

**Note:** For some of the proposed factories where we could not get figures of crushing capacity, we have assumed it to be 2500 T/d, the normal minimum capacity. Source: Sugar Commissionerate, Pune

comes scarce. Osmanabad crushed 26.35 LT of sugarcane through its 9 sugar factories<sup>11</sup>. Significantly, here the district Collector had written a letter in November 2012 to the Sugar Commissionerate to suspend cane crushing in Osmanabad in face of drought<sup>12</sup>. Nothing was done about that recommendation. To top this, 10 more factories are planned in Osmanabad. In the case of Beed, in addition to the existing 8 factories, 14 are in pipeline, Ahednagar has 20 with 8 in pipeline, Latur has 12 existing and 5 in pipeline and Satara has 11 existing and 14 in pipeline.<sup>13</sup> Looking at the im-

Similar situation prevails in Osmanabad, Beed, Jalna, Parbhani in Marathwada which are reeling under severe drought and where drinking water itself has become scarce. Osmanabad crushed 26.35 LT of sugarcane through its 9 sugar factories. Significantly, here the district Collector had written a letter in November 2012 to the Sugar Commissionerate to suspend cane crushing in Osmanabad in face of drought. Nothing was done about that recommendation. To top this, 10 more factories are planned in Osmanabad. In the case of Beed, in addition to the existing 8 factories, 14 are in pipeline, Ahednagar has 20 with 8 in pipeline, Latur has 12 existing and 5 in pipeline and Satara has 11 existing and 14 in pipeline.

part of existing sugar cultivation and factories on the water supplies in drought affected regions, the impact of these additional factories is difficult to imagine. The impact of water use and pollution caused by sugar factories and distilleries manufacturing alcohol will be additional.

**Absence of credible sanctioning process for new capacities** How did these factories get permissions from the Sugar Commissionerate which is the nodal sanctioning authority for sugar factories in Maharashtra? What role did the district administration play? What role do the Agriculture Department as

9 Source: Sugar Commissionerate Maharashtra, 2012-13 Crushing figures

10 Source: Sakhar Diary 2013

11 Sugar Commissionerate 11 April 2013

12 <http://www.livemint.com/Politics/tBAf2SQJDHNzcmRGmlifsM/Suspend-cane-crushing-in-11-factories—Osmanabad-DM.html>

13 Sakhar Diary 2013

well as the Water Resources Department play in this sanctioning process? What role do the farmers and people have in this sanctioning process? Who decides these are sustainable, just decisions? These are not just rhetorical questions. If prudent answers to these questions not found, Maharashtra water crisis may only get worse in days to come.

With a growth cycle of 11-17 months, sugarcane cultivation locks up the farmers, the state and the system in a vicious cycle of irrigation at any cost. On an average, sugarcane requires irrigation twice a month. Once planted, the farmers have no choice but to look for all options to irrigate it. And the sugar mills have no options but to crush the sugarcane and the downstream water consumption lock in only grows. Since the whole product cycle is so long, once the crop is in place, everyone tries to get the necessary water to run the system, irrespective of drought, water scarcity, irrespective of impact on other sections of society or on long term sustainability. The whole state machinery is slave of the survival of the sugar manufacturing process, it seems. Even the Comptroller and Auditor General, in its report for five years ending in 2007 have reported how the Sugar Commissionerate sanctioned capacities without considering water availability.

In this situation, it is very important to have credible checks before allowing more sugar factories or expansion of existing sugar factories.

However, the basic checks and balances to ensure only sustainable sugarcane crushing capacity is installed seems to have completely failed in Maharashtra. There is no acknowledgement of this reality. In absence of prudent decision making process, the repercussions are bound to be painful and far reaching, the poor and likely to be the worst sufferers.

**How much do the small farmers and poor benefit from sugar boom in Solapur?** It is true that large number of small farmers and agricultural labourers, including dalits, tribals and other backward classes are also benefiting from sugar boom in drought affected districts of Maharashtra. However, a number of researchers have pointed out<sup>14</sup> that these sections benefit much less than do the large sections. Secondly, the adverse impact of allocation of all or most of available water for this process on rest of the sections are mostly disproportionately felt by these sections. Today there does not seem to be even an acknowledgement of the collateral damage this sugar boom in Solapur is causing. As

How did these factories get permissions from the Sugar Commissionerate which is the nodal sanctioning authority for sugar factories in Maharashtra? What role did the district administration play? What role do the Agriculture Department as well as the Water Resources Department play in this sanctioning process? What role do the farmers and people have in this sanctioning process? Who decides these are sustainable, just decisions? These are not just rhetorical questions. If prudent answers to these questions not found, Maharashtra water crisis may only get worse.

Osmanabad collector said, sugarcane and tanker fed villages co exist. And as Daya Pawar's poem given above narrates, it is the women of the poor sections that are facing the worst adverse impacts. Moreover, no one is asking how sustainable are these benefits and what will happen when even the sugar mills bust, as they surely are bound to?

When Sweet Lime plantations over thousands of hectares died in Marathwada in the absence of water this year and when hapless farmers set their own horticultural plantations on fire as they could not bear to witness the wilting and dying trees they planted, sugarcane still continued to get water. So while there is a lobby to protect the sugarcane farmers, no such luck for other farmers.

Once farmers have cultivated sugarcane, the sugar industries hide behind the farmers saying what will happen to the farmers if factories do not process this cane. While the risk of cultivating sugarcane and fighting for its water falls on the farmers, sugar industries are insulated from any risk, in the name of farmers and can continue crushing, using thousands of lakhs of litres of water and polluting even more water.

**Water Consumption in 2012-13** Considering a productivity of 81 tonnes of sugarcane per hectare<sup>15</sup>, the cane crushed during 2012-13 occupied 155 864 hectares in Solapur. Considering that ratoon type of sugarcane requires 168.75 lakh litres water per hectare at farm<sup>16</sup>, which is the lowest water requirement among all types, (40% of sugarcane in Maharashtra is under ratoon type cultivation), amount of water used for cultivating sugarcane on 155 864 hectares of area in Solapur works

14 See for example Vandana Shiva reference above or [http://www.academia.edu/172012/Growth\\_and\\_Poverty\\_In\\_Maharashtra](http://www.academia.edu/172012/Growth_and_Poverty_In_Maharashtra)

15 Commission for Agriculture Costs and Prices, Ministry of Agriculture, Price Policy for Sugarcane, the 2013-14 Sugar Season Report: puts Maharashtra average productivity at 80 tonnes per hectare, Vasant Dada Sugar institute Report Dnyan Yag 2012 puts it 83 tonnes per hectare. We have assumed 81 tonnes/ hectare.

16 Commission for Agriculture Costs and Prices, Ministry of Agriculture, Price Policy for Sugarcane, the 2013-14 Sugar Season Report: Chapter 5

out to be 2630 Million Cubic Meters. This is 1.73 times the live storage capacity of Ujani Dam (Live Storage: 1517 MCM), the largest reservoir in Bhima basin and third largest reservoir of Maharashtra.

For crushing 126.25 lakh tonnes of cane, the sugar factories used a minimum of 18.93 Million Cubic Meters. This is a very conservative estimate as per guidelines of Central Pollution Control Board (CPCB), considering 1500 litres water required to crush and process one tonne of cane<sup>17</sup>. The live water storage of Ujani reservoir, at its highest was in October 2012 at 14% and it rapidly receded to zero in January and sub-zero levels from January to March<sup>18</sup> (as on 21<sup>st</sup> April, 2013, it is -32.91%)

In the entire discourse on the costs and efficiency of sugarcane in Maharashtra, the water angle, which is of a paramount importance as demonstrated this year, is the most neglected. Institutes like Vasantdada Sugar Institute (VSI) (For every quintal of sugar generated by Sugar Factories, Rs 1 goes to VSI) and the Sugar Commissionerate seem strategically silent on this.

The adverse impacts of allocation of all or most of available water for sugar business on rest of the sections of society are mostly disproportionately felt by the poorer sections. Today there does not seem to be even an acknowledgement of the collateral damage this sugar boom in Solapur is causing. As Osmanabad collector said, sugarcane and tanker fed villages co exist. And as Daya Pawar's poem given above narrates, it is the women of the poor sections that are facing the worst adverse impacts. Moreover, no one is asking how sustainable are these benefits and what will happen when even the sugar mills go bust.

Maharashtra Chief Minister and also the chairman of Commission on Agriculture Costs and Prices have said this year that there is need to make drip irrigation mandatory for sugarcane cultivation in Maharashtra. This looks more like a band aid solution, designed to continue the status quo of massive sugarcane cultivation in drought prone areas without asking if that is sustainable. In absence of such questions, drip irrigation could become a reason to continue to expand unsustainable sugar mills and sugarcane cultivation in drought prone areas.

However, when we contacted the drip irrigation cell in Vasantdada Sugar Institute and asked about the area of sugarcane under drip irrigation, we were told by the person in-charge that Drip Irrigation Cell itself does not have these figures. This indicates either that this data is not available or they are not ready to share available information.

While claiming that Maharashtra has the highest efficiency of sugarcane in the country, it is forgotten that if crop duration and water consumption factors are added in the equation, Uttar Pradesh is more efficient than Maharashtra by a whopping 175%.<sup>19</sup> Maharashtra consumes on an average 1000 litres more water than UP to produce 1 kilogram of sugar.

Even as farmers from Mohol region sat on dharna, urging Maharashtra government to release water for Ujani dam, the same Mohol block in Solapur district has 3 existing sugar factories. These factories crushed 13.56 lakh tonnes of sugarcane this year till March 2013<sup>20</sup>, using 20,340 Lakh Litres of water from 15 October 2012, when the drought was already severe till March 13, when farmers from Mohol were protesting in Mumbai for drinking water. So even when farmers were protesting for drinking water, all the factories continued crushing and the district administration, sugar commissionerate as well as the state administration did not do anything to curb fresh sugarcane cultivation.

In addition, Mohol also has one more sugar factory planned<sup>21</sup>, with a capacity of crushing 6,40,000 tonnes of sugarcane, which will additionally require 133 MCM water at farm and 222 MCM water at source to cultivate this sugarcane and 9,600 lakh litres of water to crush this sugarcane.

**Factories operating beyond sanctioned capacities** Moreover, many companies are running at higher than sanctioned capacity, increasing their water consumption and area under sugarcane in the process. Review of figures of cane crushed by various Solapur Factories (figures obtained from Sugar Commissionerate in Pune) for the last two crushing seasons show that at least four of these factories crushed much more cane than their sanctioned capacities in both the years and an additional seven factories crushed much more than sanctioned capacity in one of the two years. The highest % by which the cane crushed exceeded the sanctioned capacity was 120% above the sanctioned capacity. This over crushing has many implications, the prominent one being extra water consumption.

17 <http://cpcbenvis.nic.in/newsletter/agro-dec-1994/dec943.htm>

18 [www.mahawrd.org](http://www.mahawrd.org): dam storages

19 CACP, Ministry of Agriculture Report, Chapter 5

20 Sugar Commissionerate, April 2013

21 Sakhar Diary 2013

The area under sugarcane in Solapur at its high in recent years was 1.79 lakh ha in 2011-12, which is 19.46 % of net sown area of 9.2 lakh ha in the district. Of the net irrigated area of 2.52 ha in Solapur, sugarcane take away 71.03%, way above the prudent 5% prescribed in Maharashtra. It is clear that sugarcane has been taking away disproportionate share of water of the district, at the cost of the rest of the farmers. The sugar cultivation and mills consumed 4402 MCM water. According to MWIC report, even with maximum possible augmentation (from all planned schemes, many of which are not even implemented or sanctioned), Solapur district's total share of water is 4188 MCM. But the current level of sugarcane cultivation in Solapur already seems to be using more water than the ultimate planned water allocation for Solapur.

**Pollution by Sugar mills** In addition, water pollution is a major issue with sugar factories. In Feb. 2011, Member Secretary of Maharashtra Pollution Control Board had written a letter to Secretary, Environment, Government of Maharashtra about the need for taking strong steps to curb over-production and non-existent effluent treatment by sugar factories. The ETPs in sugar factories are not monitored by any independent entities and

there are hundreds of complaints about factories polluting precious water sources through their high BOD effluents. When this author visited a Sugar Factory in drought-affected Ahmednagar District, it was witnessed that the ETP has been non-functional and in a state of disrepair for many years, with putrid effluent spread all around. The factory people questioned threateningly when pictures of this were taken.

**In the end**, while the High Court decision on releasing water for Ujani from upstream dams is welcome in one sense, the water releases from upstream dams is likely to be used up for the same unsustainable sugarcane cultivation in Solapur. There is an urgent need to look at the bigger picture as to how the sugar boom happened in Solapur in the first place. Drought is a common phenomenon in this region for centuries, as described by the Solapur district Gazetteer. Solapur experiences drought once in every five years. In the context of climate change, rainfall will become more unreliable and drought more frequent. But if corrective steps are not taken about the unsustainable sugar boom in Solapur, we may be inviting worst disasters in future.

It is high time there is a public debate about why Sustainable Sugar won't rhyme with Solapur. And something is done urgently to stop setting up new sugar factories and review the existing ones through some credible independent process.

**Parineeta Dandekar & Himanshu Thakkar**  
(with inputs from Damodar Pujari)

## NEWS

**Agitation holds work at Parbati-III HEP** Work at NHPC's 520 MW Parbati-III hydroelectric project has been stopped due to local agitation at the project site. The representatives of Project Affected Families have stopped work on the project since April 01, 2013. The major demand is for providing regular employment in NHPC. NHPC had acquired 45.80 ha land for project development. There are 75 families covered under rehabilitation and resettlement plan. So far, NHPC has not given any employment directly to any of the project affected family at the project. The project authorities informed the NHPC Board that since the project is very near to the completion, the project cannot afford any agitation by the project affected families. Hence, some solution is necessary to end the stalemate. Parbati-III on River Sainj involves construction of four units of 130 MW each. ([www.hydroworld.com](http://www.hydroworld.com) 230513)

**HP seeks Rs 1,365-cr compensation for delay in Jangi Thopan HEP** The Himachal Pradesh government has claimed Rs 1,365 crore in damages from Brakel Corporation of Netherlands for the delay in execution of the 980-mw Jangi Thopan Powari hydroelectric project. The private developer had bagged the project by quoting the highest upfront premium payment to the state in an auction held in 2005. The state cabinet in its meeting on April 23, 2013 decided to invite fresh bids for the project rather than award it to the second highest bidder, Reliance Infrastructure. The Himachal HC in 2009 ruled illegal allocation of the project to Brakel, which was found guilty by the court of misrepresenting facts relating to eligibility. The court also found that Brakel had taken huge loans from the Adani Group before paying upfront premium, which it later agreed to convert into equity. The matter was brought up before the HC by Reliance Infrastructure. Brakel challenged the HC verdict in the Supreme Court, where the matter is still pending. The state initiated two-stage bidding in 2005 for the selection of developers for Jangi-Thopan and Thopan-Powari hydroelectric projects of 480 mw each (the two project have been merged for rebidding). (Financial Express 080513)

## NEWS

**Dams may trigger more quakes in Kashmir: Experts** The presence of massive dams in Chenab Valley may prove catastrophic for people living in the region as it may have triggered the recent earthquakes, experts said. "Dams may trigger earthquakes," noted Indian seismologist Prof Vinod Kumar Gaur said. He said though dams do not cause earthquakes, they help trigger them. "Due to dams, a quake that could occur later can occur early," Gaur said.

Two people were killed and over 80 others injured while scores of buildings damaged in the Chenab valley when an earthquake measuring 5.8 on the Richter Scale, with epicenter near Kishtwar town in Chenab valley, shook the region earlier this month. After the quake, Gaur was in Bhaderwah area of Chenab valley for reconnaissance of installing seismometers, instruments that measure motions of the ground, including those of seismic waves generated by earthquakes, volcanic eruptions, and other seismic sources.

On October 8, 2005, Pakistan administered Kashmir witnessed a major earthquake with a magnitude of 7.6 on the Richter Scale killing at least 75,000 people. Kashmir witnessed the last big earthquake in 1555, and, according to experts, a massive quake is looming in the region. Kashmir has a number of dams including Baglihar, Dulhasti, Kishanganga-II, Pakal Dul, Salal (Rockfill And Concrete Dam), Sewa-II and Sewa-III. A number of dams are being constructed in Chenab valley. Jammu and Kashmir State Power Development Corporation Limited (KLSPDCL) presently has 20 hydroelectric projects with installed capacity of 758.70 MW.

Head of the Earth Sciences Department at the University of Kashmir (KU) Prof Shakeel Ahmad Ramsoo said that occurrence of earthquakes in regions having dams was making the local populace highly vulnerable. "In Chenab valley, the government has plans for a cascade of dams. Life and property of people living in areas near these dams are in serious danger," he said. He said every hydropower project should be subjected to the environment checks and how the power projects were going to change the disaster profile of the region needed to be studied. (Rising Kashmir 090513)

**AJYCP Protests against Lower Demwe HEP** The Tinsukia district committee of the Asom Jatiyatabadi Yuba-Chatra Parishad has voiced its protest against the construction of 1750 MW Lower Demwe dam over the Lohit river in Arunachal Pradesh in the upper region of the Parashuram Kunda. Reacting to the permission given by the Central Forest and Environment Ministry, the Parishad stated that the Ministry has given the permission without considering the probable plight of the people downstream in the future. The AJYCP stated that it would continue its stir vigorously against such anti-people projects. It burnt the effigy of Jayanti Natarajan, Union Minister of Forest and Environment on May 21.

The students of Tinsukia under the banner of the Tinsukia Zila Chatra Santha burnt the symbolic copy of the permission of the Forest and Environment Ministry, Government of India. The student body stated that before giving the permission, the ministry should have heard the opinions of the people living in the downstream areas of the river as the dam would cause problems for them. It demanded withdrawal of the permission and warned of continuing its stir if the demand was not met. (Assam Tribune 220513)

**Arunachal Pradesh scraps power deal with Naveen Jindal Group** Arunachal Pradesh has decided to reverse its contentious decision in 2009 to give 49% equity in its hydro-power corporation to the Naveen Jindal Group. The decision, taken in April 2013, came after a backlash from government departments and other companies having hydel projects in the state against the joint venture, which was a departure from precedent as it effectively gave the Naveen Jindal Group a stake in every upcoming hydel project in Arunachal.

"The (Arunachal) cabinet has decided to ask the Jindal Group to return its shares," Arunachal Chief Secretary HK Paliwal said. Sometime in 2009, the cabinet of the Congress government, led by Dorjee Khandu, had cleared the sale of 49% in the Hydro Power Development Corporation of Arunachal Pradesh Limited (HPDCAPL) to the Naveen Jindal Group. The state, through HPDCAPL, had committed to 11-26% equity contribution in every hydel project coming up in Arunachal, including those of other private players, adding 38,600 mw by March 2009. How the state decided to award equity in HPDCAPL to a private player in general and Jindal in particular, is not clear. According to Paliwal, Arunachal will need Rs 13,000 crore to meet its 26% equity commitment in all the hydel projects coming up in the state. So far, this north-eastern state, whose total annual budget in 2012-13 was of Rs 3,535 crore, is yet to invest anything in any of the projects.

But this arrangement not only gave Jindal greater equity control over its own projects, but also minority control in the projects of other players. According to a senior official in the state power department, the special purpose vehicle running the HPDCAPL-Jindal JV had four directors. "One was to be the managing director of HPDCAPL, the other three were from Jindal." (The Economic Times 030513) The whole deal between Arunachal Pradesh Govt and Jindals and its cancellation smells of big scam, considering no information is available as to what were amounts transacted at the time of formation and cancellation of the deal and what all happened in the intervening four years.

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