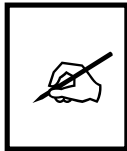


Lead Piece



The threat of unsafe Mullaperiyar Dam Why is the centre acting like a pro dam lobby?

The facts are simple, but not pretty: A dam that is now 116 year old [developed leaks and cracks during the earthquake in 1979](#). The recent most at least four earthquake tremors since July 2011 (as accepted by Tamil Nadu in an application before the Supreme Court filed on Dec 1, 2011 through Kerala says there has been some 26 tremors in the period) are only the latest of the seismic activity in the dam area in this context. Several expert bodies including the Indian Institute of Technology, Centre for Earth Science Studies have concluded that the dam structure and foundation are too weak to take the shock of earthquake of magnitude 6.5 on Richter scale, which is very much likely at the dam site. The dam is not able to take the load it is supposed to take. Its unique construction material, geological & Seismic location does not render it fit for any further technical solution.

The dam in existence since Oct 1895 lies on the soil of Kerala, and it is people of Kerala that are at risk if the dam were to collapse. At least 75000 people are at risk between this and the next dam (Idukki) in the Periyar river basin. If the Idukki dam also gives way, another 3 million may be at risk. Kerala assembly has passed a dam safety act in 2006 that requires it to decommission unsafe structures like the Mullaperiyar dam. In any case, it is the duty and mandate of the state government under constitution of India to take all such measures that are necessary for the safety of the citizens.

So the primary message is simple: Kerala should have decommissioned the Mullaperiyar dam long back. Question of any mechanism to replace the benefits that the dam may be providing are important no doubt, but should be secondary.

But Kerala government has not been able to perform its legal and constitutional duty to protect the life, livelihoods and properties of the people of its state. Not because it did not want to do it. Not because it lacks technical or financial resources to do it.

Because a neighbouring state of Tamil Nadu that controls and manages the dam does not want Kerala to decommission the dam! Because the Central Water Commission and Union Ministry of Water Resources are acting as lobbyists for large dams and they do not want the dam to be decommissioned. Also because in the pending case before the Supreme Court of India, there has been no decision in favour of the safety of the people of Kerala. The current ongoing petition has been filed in SC in 2006 by Tamil Nadu, challenging

the validity of the Kerala Dam Safety Act of 2006.

Continued to p 2

The Languishing Dam Safety Bill (2010)

A [Report from the Parliamentary Standing Committee](#) tabled in the Parliament in August 2011 has severely criticized the CWC for taking 25 years to come out with a Dam Safety Bill after it was first mooted. The report further states that the bill is entirely toothless with no clause for penalty if the dam breaches or if there is violation of the clauses of the bill, no clause for compensation of the affected people and no independent regulatory body. Looking at the current impasse, functioning of each body associated with Dam Operations and Dam Safety should be entirely accountable, transparent and there should be space for local people and independent experts in the functioning and monitoring of these mechanisms.

INDEX

The threat of unsafe Mullaperiyar dam	1
CWC Report on Water Quality Hot Spots says little, hides a lot	5
Dolphins of the Ganga: Few fading, fewer frolicking	8
How to ruin living rivers: Fall of River Shastri	11
Traditional Water Management Systems of E Vidarbha-II	14
European Commission to review CDM Hydro status	18
Flood-banks along Krishna causing conflicts	19
Fraudulent Hydropower companies in Karnataka	20
Chenab basin projects, Luhri HEP face stiff opposition in Himachal	21
WAPCOS DOES IT AGAIN: shoddy studies in Arunachal Pradesh	22
MoEF approves project rejected twice by FAC in critical wildlife area	24
West Bengal forms a panel on Wetlands	25
Atrocious: Police burn 200 floating huts at Loktak	26
Nepal: West Seti Hydropower project dropped	28
International Court prohibits permanent work on Kishanganga	29
Burma: Myitsone dam on the Irrawaddy dropped	30
Three Gorges Dam triggered 3,000 earthquakes	31
NEW PUBLICATION: ADB hydro project report in HP in HINDI	32

Continued from p 1

On Feb 18, 2010, the apex Court appointed a committee headed by the former Chief Justice of India Justice (Retd) A S Anand to look into the safety of the existing dam. But that committee, in a strange order [on Aug 31, 2011](#), declined to permit Kerala state to produce additional evidence on the issue of safety of the dam in the form of reports from two experts, Dr D.K. Paul and Dr M.L. Sharma. This is not likely to inspire confidence in the committee.

The Central Water Commission, strangely, for its ideological pro dam stance, does not want the Mullaperiyar dam to be decommissioned. But when a dam passes its useful life & becomes unsafe, it has to be decommissioned. [United States of America decommissioned 1000th dam in 2011](#), many of them for safety reasons. In India the Tajewala barrage on Yamuna and Narora barrage on Ganga were decommissioned to replace them with new barrages. In Karnataka, Tunga barrage was decommissioned when the Tunga dam was constructed in the downstream area.

In any case, CWC has had a poor track record in terms of ensuring safety of dams or safe operation of dams. For example [the 118 year old Jaswant Sagar dam in Rajasthan that breached in July 2007](#) was actually supposed to be monitored under the World Bank funded

"Dam Safety Assurance and Rehabilitation" Project. The dam safety projects were being supervised by the CWC. In spite of the dam safety project and CWC involvement, the dam did breach and strangely, no one was held

responsible. We hope Mullaperiyar dam does not breach before getting decommissioned, else there won't be anyone in CWC or elsewhere responsible, even if so many of them are swearing today by the safety of the dam.

In Rajasthan again, Gararda dam on Gararda River, a tributary of Chambal River, collapsed in the very first filling on Aug 15, 2010 when water level had reached 291 m, flooding a dozen villages downstream. Not surprisingly, the enquiry committee report submitted by Kota Divisional Commissioner highlighted criminal negligence and corruption leading to substandard work as the main causes for the collapse. ([Dams, Rivers and People](#), Aug-Sept 2010).

According to Prof. T. Shivaji Rao, three dams have collapsed in Andhra Pradesh in the last five years due to poor construction and improper design. These include the Subbaraya Sagar in East Godavari in 2010, the Palamvagu Dam in Khammam in August 2008 and the Gundlavagu Dam in Warangal district in 2006. He highlighted that these dams collapsed due to poor construction and improper design. In all, 50 dams built post-independence have failed, including the Kodaganar dam in Tamil Nadu, Nanaksagar dam in Punjab and the Machhu 11 dam in Gujarat. ([Deccan Chronicle](#) 201211)

Though Tamilnadu is claiming that there are no safety issues in Mullaperiyar, underwater visuals recorded by a remotely operated vehicle (ROV) show a deep fracture along the entire 1,200 ft length of the dam's foundation. The dam has inclined inwards as a result. The visuals came from an inspection carried out by experts, including those from Tamil Nadu and Kerala, for the high-power committee set up by the Supreme Court to look into the stability of the dam. According to officials, these CDs have been endorsed by officials from Tamil Nadu and Kerala. ([Times of India](#) 011211)

TN's poor performance in the World Bank's dam safety project leads to dropping of the state

During the Period 1991-2000, the World Bank implemented a Dam Safety Project for states of Madhya Pradesh, Rajasthan, Orissa and Tamilnadu, keeping in view that fact that India was "lagging on dam safety and many dams had become hydrologically unsafe". This was World Bank's first project entirely on Dam Safety. In 1998, Tamilnadu was dropped from this project because of its 'unsatisfactory performance' and 'failure to meet performance targets'. Its non seriousness about the Dam Safety Organization was noted as a 'worrisome'. The project noted that CWC's "lack of constitutional authority and (lack of) legislation to implement Dam Safety Program in India was a major hurdle", this has been highlighted again through Mullaperiyar. The report also categorically states that though CWC has the mandate and the capacity to initiate and lead Dam Safety works in the country, it is "showing inertia and lack of proactiveness", stressing the need for clearer guidelines and responsibilities.

The Project report points at the classic Indian symptom that major problem has been "stress on structural measures like spillway capacity, at the expense non structural safety measures" like operation and maintenance. Expectedly, the report also highlights the gaps in Reservoir Operation in India, especially in response to floods and stresses the importance of flood forecasting. Some of the recommendations of the 2000 Report are still not in place for most Dams in India ("Properly thought out operating instructions are needed and the procedures for operating gates at times of flood must be clearly defined and displayed prominently at the dam"), causing repeated mishaps and damages. (http://www-wds.worldbank.org/servlet/WDSServlet?pcont=details&eid=000094946_00071805314844)

India already has 128 large dams that are older than 100 years and additional 476 that are 50 to 100 years old. In addition, there are 202 dams for which the govt does not even know the age! All of these are likely to pose a grave risk to the people, lands, livelihoods and environment. In fact, any dam is a ticking time bomb if not operated & maintained in a safe way. Unfortunately we have no credible mechanism to ensure that.

Here it is pertinent to note that there is so little independent expertise in India on issues like safety of the dam. Moreover, on the issue of monitoring and ensuring safety of the dams and their safe operation that has such far reaching public interest dimensions. However, there is no role for independent experts, nor any transparency, leave aside ensuring accountability in issues related to dam safety. The need for such independent expertise becomes even more necessary considering that bodies like the CWC have shown their pro large dam bias and is also found to have poor track record.

It is notable here that Tamil Nadu had so “unsatisfactory performance” (as per the [Implementation Completion Report of the World Bank dated May 2000](#) for its Dam Safety Project in India in 1990s) on dam safety issue

that the state had to be dropped from the World Bank funded Dam Safety programme. Mullaperiyar dam was supposed to be part of this programme, but Tamil Nadu

failed to complete the safety programme for this dam. Even CWC was seen to be less than pro active on these issues as per the WB report.

The reason for Tamil Nadu government's stand against decommissioning of the Mullaperiyar dam is that the dam provides irrigation water to at least five districts of Tamil Nadu, namely Theni, Madurai, Dindigul, Sivagangai and Ramanathapuram. But Kerala government has assured that it will continue to provide the water to Tamil Nadu. Here it may be noted that many commentators even from Kerala have described these five districts of Tamil Nadu benefitting from the Mullaperiyar dam have call these areas as arid or drought prone. However, this is completely wrong description. The average annual rainfall in these

districts is close to or above 800 mm, with the possible exception of small part of Dindigul, where too the rainfall is above 700 mm. Such areas cannot be called drought prone or arid by any stretch of imagination. Moreover, some parts of these districts also take water intensive crops like Paddy and sugarcane, which are avoidable in such areas.

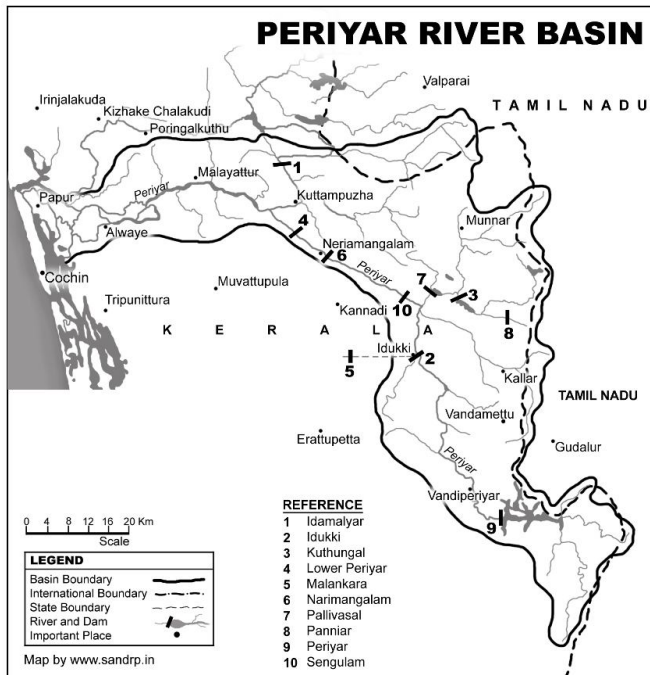
Need for a Paradigm Shift “In the first place, this project should never have been built. It is a horrendous intervention in nature. Nobody ever did an environmental impact assessment in those days as it was not the practice then. Nobody considered what harm would be done by the intervention. Today, such a project would not be approved. If it is a new project coming for environmental clearance, it will not get it. But it exists. We cannot rewrite history. However, now that the dam is 116 years old, we can start thinking of phasing it out. That means giving people time to get adjusted to this idea and seek alternative sources of economic activity, and perhaps a different pattern of development that does not require so much water. It might well be a more modest but sustainable kind of development. *Any dam has a life*”- Dr. Ramaswamy Iyer ([Frontline](#) Dec 2011)

“If the dam can store water then it works.”- Dr. D.K.Paul, IIT Roorkee ([Business Standard](#) 131211)

An appeal to the Supreme Court In a Press Release and joint appeal to Chief Justice of India, the Ministry of Water Resources, the Ministry of Environment and Forests and the Kerala and Tamil Nadu Governments, River conservation groups, environmental NGOs, including SANDRP, independent thinkers and experts all over India have come together to request them to take immediate steps to ‘decommission’ the 116 year old Mullaperiyar dam given the grave threat to people and environment below the dam. The appeal also states that the proposal to build a new dam put forward by the Kerala Government just downstream of the present one is not the only option to resolve the dispute.

A replacement dam will repeat the present day threat after another few decades. The solution has to be a long term one that addresses the problem and does not let it recur in a few decades. The Treaty still has a life span of nearly another 875 years whereas the lifespan of the new dam will be much lower. The groups while acknowledging that the water needs of Tamil Nadu have to be respected and honored by the state of Kerala as per the Treaty, strongly recommend considering ‘alternate options to water management’ for Tamil Nadu in the place of the status quo dam option. The location of the new dam site which is within the Periyar Tiger Reserve is not desirable. The demand for a new dam seems to outweigh everything else.

It is actually an unparalleled magnanimity from Kerala that no other state of India has shown. No state in India wants to give water to another state, even when the recipient state shares the basin in question. In this case, the catchment of Mullaperiyar dam is entirely in Kerala, the dam also is in Kerala, but all the benefits from the dam goes to Tamil Nadu. And even now Kerala is saying that they will ensure that Tamil Nadu continues to get the same quantity of water they get now. Not only that, the Kerala govt has given in writing that they will not even seek any expenses for the new mechanism.



Moreover, this arrangement of giving water to Tamil Nadu is a legacy of Colonial era. In 1886, a lease deed was signed between the secretary of the then Travancore state and the secretary of state of British govt in Delhi. The lease deed is for astounding 999 years. (The film *Dam 999* released recently, derives its name from this 999 year clause in the treaty. TN govt, unhappy with the connection, promptly banned the film!)

The terms of the Treaty are completely unfavourable to Kerala. Considering all the aspects, it is indeed magnanimous on the part of the Kerala government to agree to continue to provide to Tamil Nadu the water that TN is currently getting. So the solution is pretty simple. Kerala should be allowed to decommission the dam. The Centre and Judiciary should facilitate this constitutionally backed and mandated need of Kerala. A fresh treaty may be signed between the two states, facilitated by the centre and the judiciary. But the failure of the various institutions over the years since 1979 has meant that the millions of lives in Kerala continue to be at risk.

It is not that Kerala government is without blame. Kerala government has so far not even conducted a dam break analysis, nor done an analysis indicating which areas

would be inundated if the Mullaperiyar dam breaks. According [media reports](#) on Nov 30, 2011, Kerala was likely to enter into an agreement with Indian Institute of Technology (Roorkee) for such a study, but IIT Roorkee is known to have a [pronounced pro large dam bias](#) and the report is not likely to carry too much credibility. The state also has no clear disaster management plan including likely time that water will take to travel to the various locations downstream, safe places where people can be evacuated, etc.

The Kerala state advocates have also failed to counter the wrong arguments of Tamil Nadu in the courts contending that downstream Idukki reservoir would be able to absorb all the water that would be released if the Mullaperiyar dam breaches. This will certainly not be the case, for example if both the dams are full at the time of breach. This was exactly the condition several times at the end of the monsoon.

Kerala government's proposition that it is ready to construct a new dam downstream of the current dam, to take care of the Tamil Nadu's water requirement is devoid of logic and necessity. The [Mullaperiyar Agitation Council has rightly opposed](#) this proposal, since there are non dam options (a diversion weir to ensure that water from Mullai and Periyar is diverted to the existing tunnels and if necessary, TN can build additional local tanks in the benefit zone to store the water) available for ensuring that the concerned farmers in the Tamil Nadu continue to get water for their agriculture. The residents of Vandiperiyar town (Kerala) in the path of the river downstream from Mullaperiyar dam have been on the streets for months, since they continue to be at risk from the likely breach of old or new dam. The risk of breach of the dam will remain alive considering that the geologic and seismic character of the area is not going to change.

On Dec 12, 2011, the centre asked the National Disaster Management Authority to set up expert panel to prepare submergence models in case of earthquake like scenarios. However, in a strange move, during the visit of the Prime Minister to Tamil Nadu on Dec 25-26, it was announced that the notification constituting the panel has been put on hold! The centre is not even serious about disaster management, it seems.

The Supreme Court of India, in its various judgments has upheld the **precautionary principle**, the **principle of intergenerational equity** and right to life. All these are eminently applicable in the case of Mullaperiyar dam and the people of Kerala at risk from its breach. Let us hope wiser counsel prevails and fundamentalist position does not hold the safety of lakhs of Kerala people hostage. In fact this issue also has larger lessons in making other dams and their operations safe in India and creating credible, transparent, participatory mechanisms to ensure that. We clearly do not have any such mechanism today.

Himanshu Thakkar (Edited versions of this article appeared in Rediff.com and ECO magazine)

The Compounding Crisis of Water Quality

CWC Report on Water Quality Hot Spots says little, hides a lot

On Oct 31, 2011, Union Water Resources Minister released a report *Water Quality Hot-spots in Rivers of India* by the Central water Commission (CWC), in the presence of the Union Minister of state for water resources, Secretary, additional secretary and Joint Secretary, Union Water Resources Ministry. According to the Preface, the report "attempts to provide the water quality scenario of our rivers viz-a-viz BIS and other Standards. The report is based on the average values observed during the last 10 years at CWC monitoring Stations".

Long term water quality reports like these done by national agencies in charge of managing water resources have a great value, in terms of documentation as well as analysis of trends. However, a brief look at the report brings out severe limitations and shortcomings which inherently impair the value or use of this report.

CAG Report of endorses SANDRP

Comptroller Auditor General's Report *Water Pollution in India 2011-12* notes inadequacies on all fronts of water pollution control from legislation to inventorisation of water pollution, its health impacts, implementation of projects like NRCP and NLCP and institutions associated with it. It has criticized MoEF as well as the states for their poor performance on these fronts including under utilization of funds earmarked for pollution control. *It has slammed the PM lead National River Conservation Authority for failing to monitor the thousands of crores being spent on this project. The PM headed council has not met at all since June 2003. The standing committee has not met since March 2003.*

SANDRP had highlighted this in the cover story of June July 2010 issue DRP see: hwww.sandrp.in/drp/DRP_June_July_2010.pdf.

On Nov 5, 2011, SANDRP wrote to the CWC chairman with a copy to all the dignitaries present at the report release function (see list above) along the lines of following points. Needless to add, no response from CWC has been released till date, though a confidential source tells us that some CWC officers were concerned about the poor quality of the report as was evident from our letter.

1. While the report gives general background information about water per se (some of which seems to have been copy-pasted from American reports), it fails to provide

specific locations of the 371 sampling sites or depict them on maps. Rationale for selecting these sites has not been given either. So when the report claims that "The data for water quality is generated for almost all major, medium and minor rivers in India through a network of 371 water quality monitoring stations of CWC", it is impossible to ascertain this or check the water quality at a specific location.

2. The report does not give the **date, month or period of observations, except stating 'monsoon or non monsoon'**. Without these specific details, it is impossible to understand when a specific situation exists. It also makes ascertaining, cross checking and comparing the observations with other time periods and observations of other agencies impossible.

3. According to the foreword, "The report is based on the **average values** observed during the last 10 years at CWC monitoring Stations." If indeed all of the report is based on average values (it seems so since even when the tables in the annexures list the locations that exceed the BIS standard values, it is not stated as to at what date of how many times the locations have exceeded the prescribed limits) than that again reduces the value of the report since it does not provide actual situation at any given point of time. Without these details even these tables are of very limited use. It is imperative to know if it is the average value of the locations listed in the tables have indeed crossed the prescribed values or it is some specific observations that have crossed the prescribed values. Dates on which the observed values exceeded the prescribed values should have been published. Considering the fact that observations were recorded at frequency of once a month, stating all the relevant dates should have been easy.

4. It is indeed surprising that in many cases, what CWC observations in this report and CWC's river water quality site (www.cwc.gov.in/main/webpages/wq_status.html) has **many gaps**, including the missing observations for the Cauvery and the Southern River Organisation, Lower Ganga Basin Organisation, Mahanadi and Eastern River Organisation, Narmada Basin Organisation, Yamuna basin organization.

As such, the report seems to be giving a picture too good to be true. More seriously, the findings are in contradiction with the known observations given by the other reports like that of the State Pollution Control Boards, Central Pollution Control Board and Ministry of Environment and Forests' National River Conservation Directorate (NRCD). It is clear that the CWC has not compared these observations with these other known observations or tried to look for reason for the discrepancies between CWC observations and those in other reports mentioned above.

For example, many rivers in the Ganga basin, including Yamuna, Gomati, Damodar and others are known to be highly polluted particularly close to the urban and industrial locations, as reported by the CPCB, PCBs and NRCD among others. But strangely, the only place these rivers figure in CWC report are in tables listing locations that exceeded the prescribed Biological Oxygen Demand (BOD) and (Dissolved Oxygen). This is misleading, to say the least. In many rivers like the Mula Mutha Rivers near Pune, the DO has been much lower than 5 mg/l and BOD much higher than 3 mg/l on many occasions, but the report does not mention this. Similarly, many rivers like Mithi are immensely polluted, with very high BOD (69 mg/l), but it does not find any mention (see: <http://mpcb.gov.in/images/pdf/annualreport0405b.pdf>). This does not make for a representative report.

5. The CWC report does not include findings of the basic parameters mentioned in the Uniform Protocol on Water Quality Monitoring Order, 2005. For example, in case of heavy metals, only Arsenic is reported, while Uniform Protocol recommends minimum inclusion of Cadmium (Cd), Mercury (Hg), Zinc (Zn), Chromium (Cr), Lead (Pb) Nickel (Ni), Iron (Fe). This information is directly related to health issues and is hence very crucial. Nor does it include information on micro pollutants like pesticides.

6. No attempts have been made at comparing and analysing results from different agencies and drawing trends, which would help in understanding the causes of pollution. This is an important function of a report like this. It does not mention the recent efforts in the same

direction like the National water Quality Monitoring Program 2010, by CPCB, involving 2000 stations.

7. One clear indicator of rivers with good water quality is the existence of **good biodiversity**, including fisheries in the river. The report makes no mention of this at all.

8. One of the major reasons for the sad state of rivers in India is that they have **no freshwater** as all the water in the rivers are being stored or diverted by the dams, barrages and hydropower projects, leaving no water for the downstream rivers.

There is no policy or law in India that requires that water be released downstream of such locations for the various social, environmental, economic and other services that the river provides. The Central Water Commission and Ministry of Water Resources that CWC is part of has not done any effort to make this possible, even though the National Water Policy speaks about it.

The reports states in the preface that "Rivers are our lifeline and we all have the responsibility of preserving it, to make our development and consequently quality of life sustainable." What effort is CWC doing to ensure that these lifelines exist as lifelines?

9. One would expect that such reports and the fact that CWC has been monitoring river water quality for several decades would mean that the findings of the report would be used as inputs into other aspects of CWC/MWR work, including ensuring that rivers have freshwater flows when they give clearances to the projects. There is no evidence that this is happening.

Delhi HC issues Contempt notice to Delhi Govt The Delhi High Court has issued contempt of court notices to the Delhi Government, the Delhi Development Authority and the Municipal Corporation of Delhi asking them to explain why contempt proceedings should not be initiated against them for their failure to build enclosures along the Yamuna in the Capital for immersion of idols and religious material to control pollution. The Government had in an affidavit in 2007 informed the Court that it had chalked out a plan in association with the DDA and the civic body to build 13 enclosures along the river for immersion of idols and thereafter release the water after treating it. However, the contempt petition states that the Government instead of constructing the enclosures as promised to the Court had been promoting immersion of religious material into the river at the festival time by providing access to vehicles carrying idols for immersion into the river by various religious organisations. (The Hindu 261111)

Lucknow court issues warrants against Mathura Municipal officers for Yamuna pollution A special court in Lucknow has issued non bailable warrants against the Chairman, CEO and Engineer of Mathura Municipal Corporation for letting untreated waste pollute the river Yamuna. This stretch of the river is under the Yamuna Action Plan. It is indeed a shame that public authorities need to be hauled up by the courts to ensure that infrastructure created using foreign loans actually work. (Yamuna Jiye Abhiyan, 071211)

Notices, warrants by PCB against Kolhapur Corporation The Pollution Control Boards have been filing cases against many municipal corporations for releasing untreated sewage into rivers. In Kolhapur, the Maharashtra PCB has reportedly sent 3 notices, issued warrants and even cut electrical supply of the Kolhapur Municipal Corporation for not treating sewage. Incidentally Kolhapur MC and Panchganga River have been funded under the National River Conservation Program. (www.mpcb.org)

Maharashtra PCB report highlights water quality crisis in metros The report *Water Quality Status of Water bodies in Maharashtra for 2007-09* brings out some disturbing realities. It states nearly 50% sampling locations exceed A II class standards 50% of the time, while at 17% of locations, these standards are exceeded at all times. The report compiled data and analysis from various sources like the National Water Quality Monitoring Program, State Water Quality Monitoring Program and the Hydrology Project. Samples for all major and minor rivers, seafronts and creeks and groundwater of Maharashtra were collected from various locations through organizations of the state and center. According to the report, 'Water quality data for three years during the period 2007-2009 for 59 rivers, monitored at 248 locations, 33 coastal water and about 3500 groundwater stations in 35 districts of Maharashtra have been analyzed.

Monthly water quality data for selected physico-chemical parameters viz. pH, DO BOD, Ammonical Nitrogen and Nitrates for the years 2007-09 was compared with the Maharashtra Pollution Control Board Water Quality standards of class A-II for best designated usage.

Percent exceedence of these parameters with respect to the standards show that at **140 locations out of 248 monitoring sites, the values exceeded the stipulated standard 50% of the times.** At 103 other locations, the parameters exceeded the stipulated standard 75% of the time. **At 43 locations, the parameters exceeded the stipulated standard all of the time.**

Rivers with locations where the BOD values exceed the standards 100% of the time are Bhima, Damanganga, Godavari, Indrayani, Kolar, Krishna, Mithi, Mula, Mutha, Pawana, Pedhi, Purna, Tapi, Ulhas, Vaitarna, Wenna and Wainganga.

Disturbingly, of the 30 monitoring stations singled out for 'Very bad' Water Quality Indices, 17 are from

The Allahabad High Court order closure of tanneries in Kanpur The HC made this order stating that the Chromium based tanneries are contributing to pollution in Ganga in an unprecedented manner. Hearing a PIL on abatement of pollution in the river Ganga, a division bench passed the direction after the reports by the Central Pollution Control Board and the UPPCB revealed the chromium level in the water of the river Ganga was **248 mg/litre, against a permissible level of only 2 mg/litre, more than 100 times the permissible limit.** There are nearly 100 listed tanneries operating in Kanpur. The court also took strong note of the lack of interest being shown by the state government's Urban Development department and the Uttar Pradesh Jal Nigam in the matter.

(<http://www.indianexpress.com/news/hc-orders-shutdown-of-kanpur-tanneries-for-polluting-ganga/854272/0> Indian Express 010111)

Pune District (15 from Pune and Pimpri-Chinchwad Municipal Corporation limits).

However, like the CWC report, this report also deals with average values and hence very high outliers can get ignored. The water quality of most Seafronts and Creeks of Maharashtra has been found to be poor. Percent exceedence of BOD at all 29 beaches and seafronts are 100%. In case of groundwater, Nitrate pollution is becoming more prevalent and serious. The studies carried-out by Groundwater survey and development agency and Central Ground water Board during the period 2007-2009 reveal that **87 Talukas in 21 districts have shown nitrate levels above desirable limits, 100% of the time.**

CAGs Performance Audit of Water Pollution in India The Report of the Comptroller and Auditor General of India for the year ended March 2011 about results of [the Performance Audit of Water Pollution in India](#) is one embarrassing document for the MoEF, MoWR and PCBs. The audit looked at nearly all facets and issues related to water pollution and its control mechanisms set up in India, from causes of water pollution, to its impacts to institutions and policies that affect the issue, to allocation, disbursement and utilization of funds allocated for control and mitigation of water pollution in 140 projects across 24 polluted stretches of rivers, 22 lakes and 116 blocks across 25 States of India.

The audit concludes, though not surprisingly, that: MoEF and member states did not undertake comprehensive inventorisation of water sources including rivers, tanks, aquifers etc and water pollution (as is clear from the Report on Water Quality Hot Spots), current programs and institutional set up to manage these was inadequate, important issues like links of pollution with health and ecosystems have not been well studied, no program to assess and control ground water pollution exists, Programs like NRCP and NLCP, despite costing a lot have not resulted in any significant results.

CAG has come down hard on NRCP and NLCP stating that these projects leave much to be desired. There has been no system behind selection of a particular lake or river for the program, there have been several shortcomings with the DPRs and funds utilized. In conclusion, the report states that 'programmes for control of pollution have not succeeded in reducing pollution levels in ground water and surface water and restoring water quality.' The Mechanism set up by MoEF with CAG to take follow up steps does not inspire confidence as it does not attempt to serious deficit of democracy in governance of water pollution. Today there is no role for local communities the worst affected ones by the pollution, have no role in pollution control mechanism and that needs to be addressed.

Dolphins of the Ganga: Few fading, fewer frolicking

Gangetic Dolphins have been crowned as India's National Aquatic Animal. But, looking at the condition of our 'National' River Ganga, this is not very reassuring news. Fates of creatures like Dolphins, which are at the apex of the food chain, and the ecosystem in which they thrive are inseparable. Only a healthy river will support dolphins and frolicking dolphins will always point towards a healthy river. Here is a brief report on the status of the iconic specie in an iconic river system.

The Gangetic river dolphin is one of the four freshwater dolphin species found in the world. They fall under Schedule I of the Indian Wildlife (Protection) Act and have been declared an endangered species by the International Union for Conservation of Nature (IUCN). This species found in India, Bangladesh and Nepal - is blind and finds its way and prey in the river waters through 'echoes'. There are only about 2,000 Gangetic river dolphins left in the Ganga Brahmaputra system, down from tens of thousands just a few decades ago. According to the World Wide Fund for Nature (WWF), in the 1980s, there were around 3,500 dolphins in the Ganga delta region alone. Main reason for the decline in population is habitat destruction through dams and barrages, pollution, and poaching.



Education & Awareness Dolphin Camp at VGDS, Bhagalpur: School students & Teachers of West Bengal, U. P. & Bihar ready to go into the River to see the dolphins **Photo:** Dr. Sunil Chaudhary

Despite being a scheduled I endangered species, the mammal faces grave threats. Dams are being planned on rivers like Lohit, Dibang and Siang irrespective of the fact that there is a well documented population of Dolphins in the Brahmaputra river basin, which has been presented to the authorities a number of times. If the presence of Dolphins does not lead to wise decisions or voluntary restrictions, what is the point in giving them fancy titles like National Aquatic Animal?

In the recent past, Dolphins have played an important role in notifying 164 kms stretch of Ganga from Bijnor

Damning the Dolphins Gangetic Dolphin, found in the Ganga-Brahmaputra system in India and Bangladesh, lives in one of the most densely populated areas of the world. It is threatened primarily by the **damming of rivers for irrigation and electricity generation**, which degrades habitat, isolates populations and prevents seasonal migration.



More than twenty barrages (low, gated diversion dams) and eighteen high dams have been constructed in the Ganges-Brahmaputra-Megna and Karnaphuli-Sangu river systems alone since 1956, **and in the northern Ganges tributaries at least three of six subpopulations that were isolated by barrages have recently disappeared.**

Many individuals swim downstream through barrage gates during the wet season, but are unable to return in the dry season due to strong downstream hydraulic forces at the gates. Further declines are expected as more barrages are planned and are under construction throughout the species' range. The large number of hydropower projects under construction and planned in various tributaries of the Ganga also threaten the species. The proposed Ganges-Brahmaputra inter-link canal and dam project will undoubtedly result in further habitat loss and degradation, population fragmentation, and an increase in dolphin stranding. (www.edgeofexistence.org/mammals/species_info.php?id=65)

Barrage to Narora Barrage as a Ramsar site in 2005, mainly through initiatives taken by WWF. Fishing and poaching is banned in this stretch, though it continues to receive polluted effluents. Narora barrage has a fish pass, but it cannot be used by bigger species like Dolphins and this Ramsar stretch is more or less like a long enclosure.

Apart from Upper Ganga Ramsar site, Gangetic Dolphins find refuge in the National Chambal Sanctuary on the Chambal River and also the Vikramshila Gangetic Dolphin Sanctuary on Ganga in Bihar.

Rare good news from Vikramshila Dolphin Sanctuary

The population of the endangered Gangetic river dolphin has grown to 223 from about 175 last year at the Vikramshila Gangetic Dolphin Sanctuary, India's only dolphin sanctuary located in Bihar. This was revealed in a census conducted recently by the Vikramshila Biodiversity Research and Education Centre (VBREC) of Tilka Manjhi Bhagalpur University (TMBU). Set up in 1991, Vikramshila Dolphin Sanctuary is spread over 50 km along the Ganges River in Bhagalpur district of Bihar.

Dr. Sunil Chaudhary, coordinator of VBREC told SANDRP that Vikramshila example highlights the fact that conservation is possible in most difficult circumstances, through people's participation. He stressed that Vikramshila has been able to achieve a thriving population of Dolphins because of VBREC's focus (which is now joined by Bihar Forest Department) on participation, awareness generation and education of local communities living near the 50 km long stretch of Ganga about the importance of the mammal.

According to Dr. Chaudhary "VBREC did not preach, but through innovative methods like street plays and open discussions highlighted the fate of the animal and the holy Ganga. People of the region have a very spiritual relation with the river and though impoverished, they are ready to give up on some of their privileges for the river". This is the place where the Ganga Mukti Abhiyaan of the 1980s started, when local fishermen agitated against leasing 80 kms of Ganga to rich landlords.

Fishing has been stopped on the Vikramshila Sanctuary river stretch and conflicts with fishermen are rare. However, Dr. Chaudhary notes that this need not be so and that long term conservation of specie in isolation is not possible. "To conserve riverine species, we first need to conserve the river and its ecosystem, which includes its people. ***I believe that traditional fishermen of Vikramshila stretch should assert their fishing rights in the river. Sustainable fishing is possible with some restrictions on the fishing gear used and identifying riverine stretches which are not frequented by Dolphins. This will go a long way in Dolphin conservation and also equity.***"

According to Dr. Choudhary, isolation of community from their ecosystems is not a good idea in the long run. He pointed out to the utter failure of plans like the Ganga Action Plan to bring about any form of change, in the absence of local participation and leadership.



Gangetic Dolphin, Smooth-coated otter and Gharial: endangered Wildlife of Vikramshila

Vikramshila Sanctuary has been managed effectively by VBREC since 1995. It is approximately 300 kms upstream of Farakka Barrage and more than 450 kms downstream of the Narora Barrage. Absence of dams in the vicinity is a crucial reason for the health and teeming biodiversity in the river. Ganga here supports 76 fish species, turtles, Gharials and smooth coated otters (both are Schedule I protected species). However dams as distant as the Farakka Barrage have affected the ecological balance of this stretch. Hilsa fish which used to migrate right upto Bhagalpur before the barrage are now locally extinct.

On the other hand, fate of Dolphins and Gharials in the National Chambal Sanctuary seems unclear. In May 2011, the National Board for Wildlife, under the Chairmanship of Jairam Ramesh, the then Minister of State of Environment and Forests, gave permissions to the 330 MW Dholpur gas-based combined cycle thermal power project stage-II for drawing water from National Chambal Sanctuary. The study report on the water intake requirement of different projects from the Chambal River by the Director of the Wildlife Institute of India had

recommended that no new projects could be allowed for taking water from the Chambal River as the present flow was inadequate and declining at 3 per cent every year.

According to the only dissenter to the NBWL decision, Prerna Bindra, "The Chambal River harbours 85 per cent of the entire population of the critically endangered gharial and a high density of the national aquatic animal, the Gangetic dolphin per river km. The 'Assessment of minimum water flow requirements of Chambal river in the context of gharial (*Gavialis gangeticus*) and Gangetic dolphin (*Platanista gangetica*) conservation' conducted by the Wildlife Institute of India categorically states that ***any further withdrawal of water from Chambal river will seriously affect the gharial, the wildlife and other ecosystem service values of the river.***" ([Writetokill](#) 280511) Unfortunately, with regulating bodies like the NBWL, one exception to the rule will spur the next. All in all, fate of Gangetic Dolphins in India is worrisome, despite a few remarkable success stories.

In downstream **Bangladesh, three areas in the southern Sundarbans mangrove forest have been declared as dolphin sanctuaries** to protect Gangetic Dolphins. Sunderban mangrove forest is the only place in the world where both Gangetic and Irrawaddy dolphins are found. Both are endangered and have been declining sharply due to fragmentation of their habitat through multiple dams and barrages. In Bangladesh, an added threat is rising salinity level and reducing freshwater flows in rivers, which are attributed to upstream dams.

Wildlife Conservation Society's Bangladesh Cetacean Diversity Project (BCDP) has selected areas of Dhangmari, Chandpai and Dudhmukhi areas of eastern Sundarbans for protection as dolphin sanctuaries. It has been reported that an official notification on establishing the sanctuaries will be issued by the ministry of environment soon.

According to officials from Forest Department, "waterways in these areas will be clearly demarcated and there will be signposting for local fishermen to avoid this area. Declining freshwater supplies and rising sea levels due to global climate change are affecting the dolphin population."

It is unclear what will this protection order mean in terms of freshwater inflows from upstream, which is an important factor in the distribution of this species. It has been documented that the outfalls of the Ganga Brahmaputra basin have been decreasing, following upstream dams and water diversions. ([Times of India](http://www.timesofindia.com/031111) 031111)

Meanwhile, the fate of **Indus River Dolphins in India and Pakistan** hangs on a string due to the excessively dammed and dry Indus. The Indus River dolphin is generally found alone or in small groups in the deepest channel of the Indus River. Its range has drastically decreased over the past century as a result of the construction of irrigation barrages (low, gated diversion dams), which have fragmented the population, and reduced available habitat by depleting the volume of water flowing downstream. Concerted conservation action is needed if this species is to survive. (www.edgeofexistence.org)

The species formerly ranged throughout the 3,500 km Indus river system in Pakistan. Today the majority of the dolphins are restricted to less than 700 km of river. Now, the majority of the remaining population is found in the mainstream between the Sukkur and Guddu barrages in Sind Province. The most significant threat to dolphins in the Indus has been the construction of at least 25 dams and barrages (including irrigation barrages at Sukkur in 1932, at Kotri in 1955, and at Guddu in 1969) that have severely fragmented the population and reduced the volume of water, particularly downstream of the Sukkur Barrage, causing the dolphins' dry-season range to

shrink. Subpopulations on either side of barrages are now isolated and thus are more vulnerable to extinction due to hunting or environmental change. Like in the case of Gangetic Dolphins, Indus Dolphins are also supposed to swim downstream through barrage gates during the wet season or during canal closure, but are unable to return. Since the mid 1990s, there have been increasing reports of dolphins trapped in irrigation canals near Sukkur Barrage, many of which die when the canals are drained for annual de-silting and maintenance. (http://www.edgeofexistence.org/mammals/species_info.php?id=66)

Recently, a population of Indus Dolphins has also been discovered in the Harike Wildlife Sanctuary at the confluence of Beas and Sutlej rivers. It is estimated that Beas, Ravi and Sutlej may have about 20 Indus Dolphins. ([Times of India](http://timesofindia.com/031011) 031011)

Two more Indus Dolphins were found dead in the Indus River near Sukkur Barrage, putting the number of dead dolphins found in Sukkur to 28 in six months. ([The News Tribe](http://tribe.com/131111) 131111)

Conclusion Conservation of critically endangered species like Dolphins, Gharials or otters call for holistic, in situ conservation solutions which aim at protecting the entire ecosystem. Such ecosystem protection has many spill-over benefits like protection of allied species and improvement in ecological goods and services to the community. Unfortunately, we have been viewing conservation in an extremely myopic way. Dams and hydropower projects like the ones in North East, Himachal and Uttarakhand have been destroying habitats and migration routes of endangered fish like Dolphins and Golden Mahseer. Environment Impact Assessments and Environment Management Plans are looking at fish farms and restocking reservoirs with fingerlings as the only solutions, without even considering ecological options. Fish ladders have not been looked at seriously in India and neighbouring countries and it is high time that the various fish ladders which have been prescribed in recent the environmental clearances are checked and monitored with community participation.

Fish ladder could certainly a solution in case of barrages and low dams. In places where functioning fish ladders exist (as we saw during a trip to the Narora barrage earlier in November 2011, here the fish ladder is in existence since 1960s!), a credible assessment of the effectiveness of the fish ladder for the various relevant species is urgently required. The Narora fish ladder size is clearly not adequate for dolphins, for example.

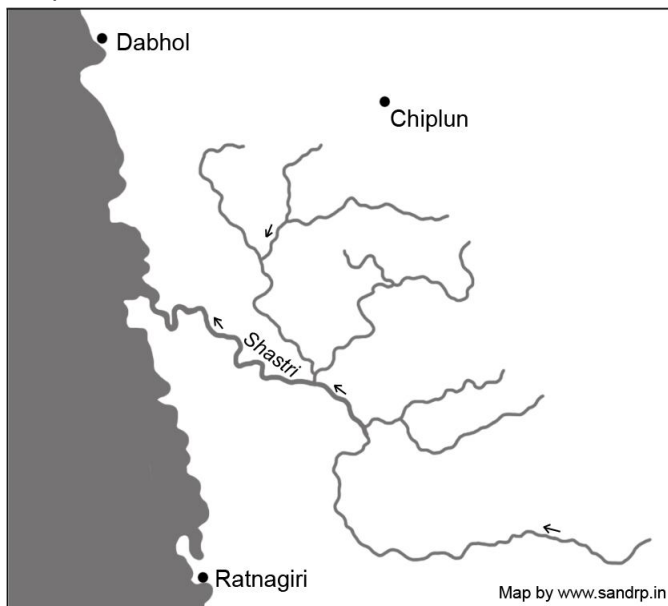
All in all, it looks like the fate of riverine biodiversity and dependent communities rests on a few wise actions. We have the blue prints and the lessons learned. What we need is the will and the wisdom to put it in practice.

Compiled by Parineeta Dandekar

How to ruin living rivers: Fall of River Shastri

Living, healthy rivers which perform their hydrological, social and ecological functions are becoming a rarity in our country. We are flooded with news about rivers being dammed, dried and polluted and weaker communities ending up paying the price for our short sighted development paradigm. And yet, there exist some rivers which are still rivers in the true sense: they flow, support biodiversity and hold value not only from the 'goods and services' perspective but for their cultural, social and aesthetic significance. In an ideal scenario, these rivers should be protected. Let us see what is happening.

River Shastri is one of the few undammed, unpolluted and pristine rivers in the Northern Western Ghats.



The river emerges from Prachitgad, a historical fort in the newly-declared Sahyadri Forest Reserve at an elevation of 839 m above sea level and flows down to the west of the Sahyadri mountain ranges, meeting the Arabian Sea in a short journey 90 kilometres, forming a basin of 2173.55 sq. kms. The basin falls entirely in the Ratnagiri district of Maharashtra, a region famed for its rich horticulture: Alphonso mangoes, cashew nuts and jackfruits. It covers three blocks: Sangameshwar, Ratnagiri and Guhagar. Tributaries of Shastri include Gadgadi, Bav, Gad, Asavi and Gandagi. In its short journey, Shastri provides goods and services to around 80 villages in the basin. It meets the sea near Jaigad, forming a magnificent creek which is a haven for fishermen and mangroves and a rearing ground for fish and aquatic animals.

SANDRP has been studying the Shastri for the past year to analyse the range of benefits a free flowing, unpolluted river can provide to the community at large.

Here is a snapshot of what we found:

In the upstream (From Shringarpur to Sangameshwar):

Drinking Water The entire town of Sangameshwar with a population of 12000 depends on the river (and wells) for domestic water supply through jackwells in the river.

Fishing and riparian gardens Shastri and its tributaries provide livelihood security to more than 5000 people through activities like freshwater fishing, and riparian farming along its banks. Villages on the banks of Shastri, Bav, Sonvi, Saptalingi and Gad have flourishing riparian vegetable gardens with seasonal vegetables.



Freshwater fish of Shastri in local market

In villages like Wanjole the management of vegetable gardens is handled by women, right from watering the gardens with river water to selling the produce in nearby towns of Devrukh and Sangameshwar. Water is drawn from the river directly through traditional systems like *Ukti*, channels or recently, pumps. This provides income to about 2200 families in the Shastri basin.

Freshwater fishing is carried out by special tribes, as well as women in all riparian villages using indigenous techniques, but the catch seldom comes in the market and is used for domestic consumption.

Zone of Tidal Influence: River bank cultivation along the zone of **tidal influence**, where the water is brackish, is also rich. This zone has small land holdings of a hectare or less and riparian farming occurs on an approximate area of 550 hectares. Pulses and vegetables are mainly cultivated and the cropping pattern changes with seasons and changing salinity of water. Vegetables from this area are sold in markets of Ratnagiri, famed for their unique taste, which is locally attributed to brackish water and the zone is organic 'by default'. This riparian zone provides subsistence and employment to nearly 1550 households.



Farming along the zone of tidal influence

Cultural Significance Shastri epitomises Indian reverence for rivers with Shiva temples at all the hydrological junctions. Where a tributary crosses the Sahyadris and falls into the coastline forming the spectacular Marleshwar falls is the temple of Marleshwar and the tributary is venerated as *Gangotri*. At Confluence of Shastri and Alaknanda is the temple of Sangameshwar, where the Shivalinga is immersed in water from the confluence, the place where seven first order streams join to form Saptalingi tributary is hidden a sacred grove and a temple of Saptalingeshwar marks the place. The crumbling temple complex, built by the Shilahar Dynasty kings in the 12th Century has a unique structure with seven channelized streams emerging from separate chambers and flowing together in a single Kunda, which then flows on as the Saptalingi rivulet.

Considering the pristine state of Shastri, one would expect that the river would support rich estuarine fisheries and dependant livelihoods. ***But, as it turns out, this is no tale of a living river..***

Destruction of Jaigad Creek

Jaigad creek is one of the important fishing creeks in Western coast, supporting nearly 42 fishing villages. Fish catch for the year 2009-10 for Jaigad Fish landing site was 3953 Tonnes (Fish Production Report, GOM, 2010). While most fishermen go out in the open sea, some specialize in estuarine fishing, around 20 kms in the mouth of the river. These fishermen specifically do not have mechanised boats and use diesel fired 'dibkos' or manual boats. Their proportion in the overall catch is

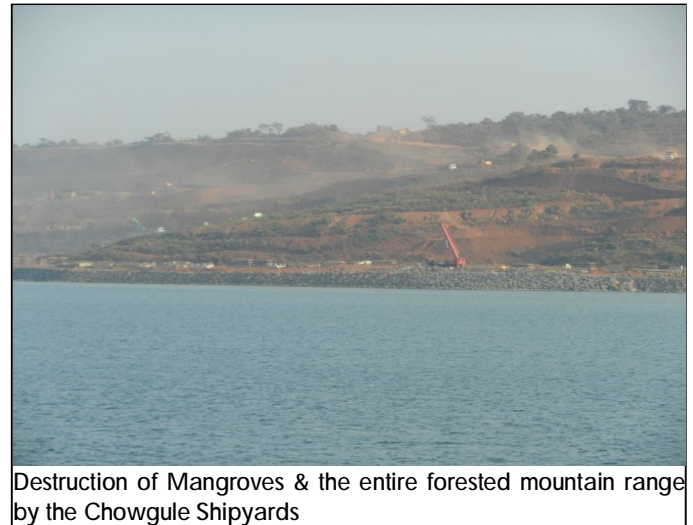
When this author visited fishing villages in the Jaigad bay and talked with the fishermen, it slowly but surely became clear that estuarine fisheries are on the verge of collapse and small time fishermen are facing extremely difficult times. Some fisheries cooperatives have reported 65-75% fall in catch in the past three years, last year being the most difficult. But how is it possible that an unpolluted, undammed river can have an unproductive estuary?

barely 1.2% (98.8% by mechanised boats with trawl-nets).

Fish catch for these fishermen has been going down drastically for the past three years, with last year being the most critical, some fisheries cooperatives claiming a 65-70% decrease in estuarine varieties. This is severely affecting their subsistence, economy and livelihoods.

I visited the village of Jaigad and neighboring Padve which is home to estuarine fishermen. While reaching Padve through a ferry, one cannot fail to notice huge patches on the left bank completely deforested and mined, with JCBs and lorries ferrying rubble, huge boats inside the estuary and construction going on in the estuary. No mangroves could be seen on this bank, while the right banks had forests and mangroves.

In the village, the fishermen told me tales that seemed to belong to any river but the unsullied Shastri. ***Estuarine***



Destruction of Mangroves & the entire forested mountain range by the Chowgule Shipyards

fish species are disappearing in river, filter feeders like shrimps and prawns have not been found for the past year at all, the species composition has changed and most importantly, catches are falling so much so that most of the fishermen are thinking of different occupations.

Reasons Some of the reasons that has lead this situation are the following.

- Shastri estuary houses two upcoming Port projects and one Thermal power plant. The Power plant has become fully operative from

the last year and ports will be operating from this year.

- These include Jindal group's 1200 MW Coal based thermal power plant.

- **M/s JSW Jaigarh Port Ltd.**, a constituent company of Jindal Group which is expected to handle **20 million tonnes cargo every year.**



Fishermen from Padve village: left without options

- **M/s Chowgule Ports & Infrastructure Pvt. Ltd.**, a constituent company of Chowgule Group which is expected to handle **5 million tonnes cargo every year.**

Both the ports have received clearances from the State Environment Department, Maharashtra State Coastal Zone Management (Ports: Expert Committee on Infrastructure Development and Miscellaneous Projects) Authority and the MoEF. Concessional agreements have already been **signed for the next 50 years**, with Maharashtra Maritime Board. These ports will be operated on a Build, Own, Operate, Share and Transfer (BOOST) basis. **The important component of this massive infrastructure development is dredging of the creek upto 14 meters depth for allowing safe draft for ships.**

Currently, the estuary which is supposed to be the most productive and bio diverse part of the riverine system is being dredged and destroyed and mangroves, which offer shelter to small fish and aquatic animals are being uprooted for about 10 kms in the creek. In addition, the JSW 1200 megawatt coal based TPP has started operating to its full capacity. The clearance of the project has been shrouded in controversies and many experts have said that the EIA has paid no attention to the impact of the water releases and fly ash generated on marine and estuarine fisheries and mangroves.

In a classic situation, villagers from Padve which are on the opposite bank of the shipyards were not included in the EIA or the public hearing and are now facing severe threats to their livelihood.

Dubious Parallels In the neighbouring estuary of Vashisthi River, livelihoods of fishermen are all but extinct due to the double whammy of unbridled pollution from the Lote Parshuram industrial estate and the inter-basin water releases from the Koyana Hydro power project. When the author visited villages along the

Vashithi Estuary, former fishermen were abound with tales of how they have had to shift from fishing to sand mining, which is now controlled by Mafia.

Incidentally, the Maharashtra Pollution Control Board has not been successful in curbing the pollution from Lote Parshuram Chemical Complex of the Maharashtra Industrial Development Corporation for the last 15 years. The MIDC Complex has not brought in promised economic benefits to local communities.

Such is the oft repeated tale of impacts of development, which paints rosy pictures in the beginning, but fails to address even the most basic local concerns in the longer run. In Shastri basin, the impact is very raw and evident right now and local stakeholders, who never faced challenges like these are entirely clueless about where to look for support.

Groundwater in jeopardy In the village of Jaigad, where local drinking water security starts and ends with domestic shallow wells, a strange phenomenon is happening.

The JSW TPP began operating in April 2010 and since December 2010, Total Dissolved Solids from local wells in the area shot up suddenly from normal (ranging below 400 mg/l) to more than 1440 mg/l, rendering the water unfit for human consumption.

This has never happened in the region before and the main culprit behind this sharp rise is the JSW TPP. The Plant has extensive ash disposal structures and ash pits in its premises, which are settled using sea water and an extensive salt water reservoir for condenser cooling. In the porous, lateritic plateau of Konkan, this ash-mixed salt water has been infiltrating in the shallow aquifer, ending up in wells. **For the past year, 1200 people have lost their water sovereignty & are dependent on water tankers which have been 'graciously' provided by the company.** Important questions which arise are how long will this last & what will happen if TDS of other wells shoots up as well (which is said to be happening)?

The tale of Shastri River is a story unfurling before our eyes of how a living, providing river is being killed slowly, affecting all beings that depend on it, from crustaceans that once inhabited its rich estuarine beds, to the fishermen who fished in the creek, to the women who had their water security in their backyards. It is a story which illustrates the complete absence of any form of ecosystem governance, participation or sensitivity from administration or private developers towards local issues. With callous precedents like these, how can we expect local communities from Konkan to support 7 coal-based Thermal Power Plants, a mega nuclear power plant and numerous shipyard projects coming up on the estuaries which will benefit the investors but render ecosystems & people total losers?

Parineeta Dandekar

Traditional Water Systems of Eastern Vidarbha-II: Current status

Manish Rajankar

The remarkable community-led water management system of Zadipatti evolved during the reign of Gond Kingdom. Though it was a decentralized system, it evolved in the feudal administrative system. After Independence, Abolition of Proprietary Rights Act was enacted in 1951 attempting to eliminate Malguzari and Zamindari of this area. The management of the malguzari tanks was then overtaken by the Revenue Department, Government of Maharashtra and they were divided between State Irrigation Department and Zilla Parishad (ZP) after the creation of Maharashtra State in 1960.

Current Management of Tanks

Tanks with irrigation capacity of 0.1 to 100 acres (1 hectare= 2.47 acres) are under the jurisdiction of Zilla Parishad, those with 100.01 to 250 acres capacity are under Local Sector of Irrigation Dept, while those with capacities between 250.01 to 1000 acres are under the jurisdiction of Medium Projects of Irrigation Dept. Tanks with irrigation capacities above 1000.01 acres and above are under the jurisdiction of Major Projects of Irrigation Department.

The ZP tanks are allocated to Gram Panchayat for management, which forms a water distribution committee looking over the distribution system. Most of the ZP tanks are traditional tanks. **People have 'Nistar Rights' over these tanks which include rights of irrigation, water for cattle and domestic use.** Due to these rights people get free water for irrigation. Nistar is a priority but currently it is assumed as monopoly of irrigation. The unrecorded uses of tanks are considered as secondary. Rights of fishing, which is the second biggest use after irrigation are not included in Nistar Patrak and hence ignored by the farmers.

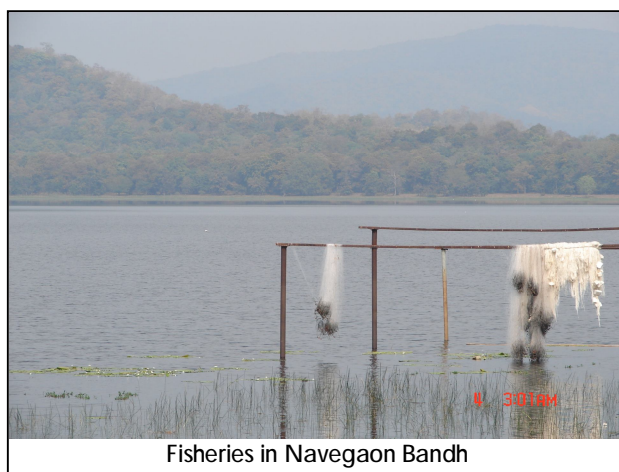
Irrigation Dept manages tanks entrusted to it and distributes water through irrigation cooperatives of farmers.

Revenue from Tank and its Systems There are 116 fishing cooperative societies in Bhandara district and 134 societies in Gondia district. Each society functions in the average area of 5 sq.km. The fishing cooperative societies have the priority in acquiring lease of all tanks in their jurisdiction area. Each society has 5 to 10 tanks, most of which are seasonal. Lease for using these tanks for five years is given by the Panchayat Samiti through

auction. In absence of the claim of fishing society, the tank is leased out to traders.

The tank is leased out for five years and the lease amount has to be paid every year. The lease amount is calculated over the area of tank that is mentioned in village level revenue records.

The revenue generated from leasing of tanks for fishing is distributed equally between Fishery and the ZP or Irrigation dept.



Fisheries in Navegaon Bandh

Generally seasonal tanks are used as nursery of fishes by Fishing Societies. Eggs are released in this tank and reared, while fingerlings are released in a perennial tank. For tanks which cover 40 to 50 hectares, fishing is restricted to 1-2 months. Traders purchase the catch at the site itself. Societies deduct total expenses of the year from the amount of sale and distribute the remaining amount equally between the registered

members (share holders). In case of bigger tanks, fishing goes on throughout the year. Societies only collect a fixed sum of Rs 15/- per kg of the catch from the fishermen.

Table. Department wise Tanks

District	Irrigation Dept	Zilla Parishad	Other Tanks*	Total
Bhandara	73	1,476	4,472	6,021
Gondia	66	1,266	5752	7,084
Grant Total				13,105

(*This category includes the private tanks and the small tanks constructed by different departments under different schemes, most of them are classified as 'Bodi' in local language)

Apart from fishing, tanks are also leased out by the Gram Panchayat/ Panchayat Samiti for *Khus* extraction (Vetiver grass) and *Shingada* (water chestnut) production. *Khus* extraction is completely controlled by the traders who get the lease and extract *khus* through local labourers. *Shingada* harvesting is done by indigenous *Dhiwar* (fishermen) community. Till date there is no system in place for lotus roots extraction. Traders purchase these at a price of around Rs 6-8/- per kg from locals.

Management of tanks post independence Post independence, water was declared as a public good and brought under the centralized management of government.

But in the case of Eastern Vidarbha this decision has not been very beneficial from the government's point of view. In this region, Government owns the tanks but due to Nistar rights, it cannot collect charges from the water users of tanks for irrigation. The agencies are also required to look after maintenance work but do not get any returns. No wonder then that the government has been ignoring these systems and their upkeep.

Earlier management of tank systems was addressed as a whole by the community. In today's scenario, part of the catchment of the tank often lies in the forest, and falls under forest department, management of the actual tank is with Irrigation Department or Zilla Parishad, the irrigated area falls under Revenue Department, which involves works from the Agricultural Department, area around the tank falls under Revenue Department, while Fisheries Department manages the actual water and fish in the tanks! All these departments have their own plans and schemes. All have their own perception and policies, rules and regulations and at times, diametrically opposite different views towards resource management and development in general. No wonder then that the current management of tanks is fraught with conflicts and confusions.

Recent changes Irrigation Department and Zilla Parishad have made many changes in the tank systems. **Most notably, they have constructed the new waste weirs by removing the old ones with only slopes.**

The old *tudum* (gates) were also removed and sophisticated gates were constructed. Further Irrigation Department has given contracts for *khus* grass extraction to contractors.

The Forest Department has demarcated its boundaries by constructing trenches on the border. Trenches were further deepened to obstruct livestock to entering forest area and control free grazing.

The Fisheries Department has introduced high yielding species of fishes to improve fish production. Originally, tanks have always been rich in fish food like phyto plankton, zooplankton and various water plants. Carp species were introduced, which competed with local and indigenous fish varieties. Initially, because of their separate feeding strata, there was no competition between these species.

Interestingly, these high yield species are herbivores and the local indigenous fish species are carnivores.

Obviously, local fish devoured the newly released eggs and fingerlings of the introduced species. In response, Fisheries Department declared local fish as threats and ordered their massacre for getting more production from water under the 'Blue Revolution'.

The **Agriculture Department** has also initiated "Green Revolution" by introducing hybrid and high yielding crop varieties and promoting use of chemical fertilizers and pesticides. Huge subsidies were also given for promotion of these items.

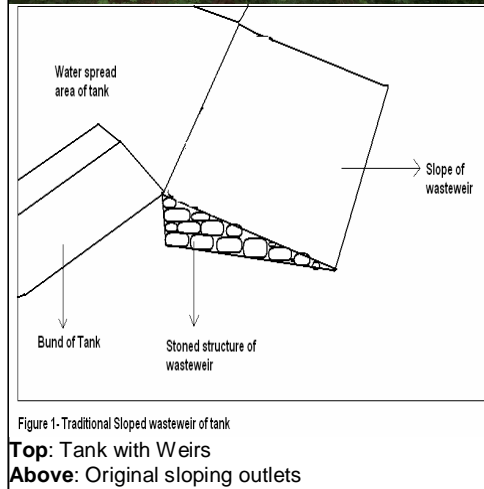
There has been a wave for improving productivity of all the natural resources. This resulted in monoculture and excessive use of subsidized resources like pesticides. All the concerned departments related to natural resources planned and designed their schemes and programmes for resource development in an isolated manner, without considering ecosystem linkages.

Today's Picture Perhaps such isolated efforts at natural resource management were well intentioned, but the resultant interventions changed the picture drastically.

Today it is experienced that relation of catchment and tank is broken due to numerous trenches diverting water coming from the forests into the tanks. The fertile alluvium, nutrient and humus that flowed with this water is also being trapped in the trenches. These elements were instrumental in the productivity and ecological balance of the tanks.

The fertilizers and pesticides from fields now flow with water into the tanks, deteriorating water quality. This has affected the aquatic flora and also the growth of fish in the tanks.

The traditional waste weirs helped maintain fish stock in the tanks. During spawning period some fish species swim against current and their eggs are released at the highest possible climb for them. The slopes of waste weir helped them to enter in the tank and go further in the upper streams. But the present design of waste weir prevents them from entering the tank, disrupting the natural cycle, laying additional burden of stocking expenses on the fishing cooperative societies.



The **design of the newly established gates** is also alien for the people. It has a sheet of metal, which goes up and down. Rubber packing is used for easy operations of the gates. After some years the packing gets damaged due to contact of water and sunlight, and the tank leaks. This cannot be repaired or replaced by the villagers, who had rich traditional knowledge about repairs and maintenance of their tanks. They now are dependent on the department for repairs, which are often not timely, also resulting in water loss.

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The **introduction of high yield species of fishes** resulted in increased production till natural fish food was available in the tanks. Year after year the fishing continued, but the aspect of fish food was neglected. Today after 30-40 years of continuous production, the major problem for the Fisheries cooperatives is drastically falling production of high yield species. The fish which used to reach to 1-1½ kg in a year now do not grow over 200 gms in a year.

Other hazard that has stricken the fish production is the contagious disease known as **Ulcerative syndrome**, which was unknown to local fishermen. It spread through the seeds of new species and has now attacked the local species. Many local species of fish are now near extinction despite the fact that they are an important component in the ecological cycle and also fetch prices as high as three times the new species. For this disease, remedy suggested by the Fisheries Department is use of Lime 200-600 kg per hectare. After this treatment, the

entire aquatic flora from the tank gets wiped out. So though the fish are cured, their food chain is destroyed.

With a remarkable number of traditional tanks (as stated above, more than 13000), this area of Vidarbha has large proportion of nomadic and scheduled tribes dependant on fisheries which are directly affected by these changes. These communities were not traditional farmers and have very little agricultural land and have to work mostly as landless labourers. Any fall in fish production affects

them severely.

Encroachments on tanks by rich farmers and influential people in the region, is now emerging as a new challenge.

These encroachers have been purposefully damaging waste weirs, so that water level is reduced and more land is available. This is affecting both the downstream farmers and the fishermen.

In this scenario the first important step needed is for communities to reclaim their ownership of these tanks and take the initiative for managing their water resources in which they were so remarkably skilled, just a few decades back. At the same time, it is imperative that the concerned government departments, which are currently functioning like isolated islands should make an effort at integrated management of natural resources.

Tanks in other parts of the country Many parts of the country are rich in natural or manmade wetlands which have been used for irrigation, biodiversity and fisheries for centuries. The man-made lakes and wetlands galore in Rajasthan. Uttar Pradesh, Bihar and Assam boast of natural wetlands created by the meandering channels of the silt-laden rivers like Ganga, Kosi, Gandaki, Yamuna and Brahmaputra. Besides being one of the most productive ecosystems, these wetlands support fisheries, drinking water supply, subsistence farming and irrigation.

Chauras in North Bihar: The Indo Gangetic region of north Bihar is characterized by palaeo levees, swamps, ox bow lakes, cut off loops or flood basins locally called "Chauras". The Chauras are excellent breeding ground for local species of fish and migratory birds and the best example of this is the Kanwar Jheel in the district of Begusarai, lying between Burhi Gandak, Old Bhagmati and Kareh rivers. The lake is formed by the meandering action of Gandak River and is now a residual ox-bow lake, one of the thousands in Bihar and Uttar Pradesh flood plains. As the water level recedes in summer, over 2800 ha of the exposed mudflats of the Kanwar Jheel are converted into rice (paddy) fields. Water from the Chauras is drained by making a water canal or a micro drainage line which meets the river. Several small check dams are built in the drainage line to store water for irrigation when the water recedes in the Chauras in summer. This in turn sustains major crops in the region: rice, maize and wheat. The Chauras are a common property resource for the farmers whose land falls in these wetlands. Depending upon the numbers of farmers and the area falling under the Chauras a user group of the farmers is formed. Use of the wetland is governed by local customary laws. Ponds are (locally called as "maan") made in the deeper parts of the Chauras and are used for rearing fish and fresh water prawns. These wetlands provide habitat for different species of fish (Inland fisheries), especially the Asian cat fish (*Clarias batrachus*, locally known as Magur fish), which is hugely popular in Bihar and UP and fetches higher prices than the regular carps. (<http://begusarai.bih.nic.in/dp.htm> and Parimal Chandra, Aga Khan Foundation, Patna)



Shringar Bodi in Bhandara, rich in aquatic flora, biodiversity & fisheries

We, as a part of the Bhandara Nisarga va Sanskruti Abhyas Mandal, have been engaged in dialogues with the fishermen and traditional water managers of the area. On the basis of these iterations, we have come to the conclusion that following measures should be taken for sustainability of this system and to protect the livelihood of dependent communities.

- The traditional knowledge of communities on water management, fishery and inter linkages of aquatic resources should be **respected** and a management of tanks should be based on a **wise synthesis** of traditional and modern knowledge.
- Traditional eco friendly and cheap practices for controlling problems like fish disease should be **scientifically tested** and adapted as necessary.
- The **local fish species should be protected** and promoted. They are an important part of the biodiversity, nutritionally and economically superior to their high yielding counterparts.
- The aquatic resources near the tanks should be managed in keeping with the Biodiversity Act 2002, through community participation. The rights of collection, processing and marketing of the aquatic resources, used for economical gains, should be given on priority to the Fishing Cooperative Societies.
- Tanks which are degraded and do not support aquatic flora should be restored on priority, utilizing funds from Mahatma Gandhi National Rural Employment Guarantee Act and Maharashtra Rural

Unlike the rest of the country, Vidarbha region still showcases a beautiful living synergy arising out of managing water resources in a participatory and decentralized manner. It strongly demonstrates the links between communities and their ecosystems and how economically viable systems can function without causing ecological losses.

Tanks which are degraded and do not support aquatic flora should be restored on priority, utilizing funds from Mahatma Gandhi National Rural Employment Guarantee Act and Maharashtra Rural Employment Guarantee Scheme (MREGS). This will help in increasing water storage capacity and irrigated area, restoring ecological balance, groundwater recharge, flood moderation and increase fisheries production.

Employment Guarantee Scheme (MREGS). This will help in increasing water storage capacity and irrigated area, restoring ecological balance, groundwater recharge, flood moderation and increase fisheries production.

- According to the MREGS, 80% of proposed work should be related to water conservation. But deepening of existing tanks and construction of farm ponds are the only available options. The rates for plantation of aquatic plants should be fixed through the pilot plots and should be incorporated in the rate list of MREGS, so preparation of proposals at local level will be possible after that.

- During tank deepening process the excavated silt is deposited on the bund or outside the tank. The

upper layer of this silt (six inches) with seeds and tubers of the aquatic plants should be maintained and spread over the tank bed after desiltation to maintain productivity.

- The encroachments in the tank should be removed, and strict actions should be taken

against offenders.

- The field channels of many tanks are destructed or encroached. In such situations the Nistar right holders use electric motors to draw water, depriving legitimate tail-enders from their share. The encroachments over canals should be removed and

repair work of these canals should be undertaken on priority.

- The regulations related to maintaining the dead stock should be implemented.

- All concerned departments should design their schemes and programs to address water management holistically.

Unlike the rest of the country, Vidarbha region still showcases a beautiful living synergy arising out of managing water resources in a participatory and decentralized manner. It strongly demonstrates the links between communities and their ecosystems and how economically viable systems can function without causing ecological losses. Let us strive towards protecting these systems and traditions as blue prints which can be used by communities across the country.

Manish Rajankar

CLIMATE CHANGE & WATER SECTOR

Ganga-Brahmaputra sediments store carbon Woods Hole Oceanographic Institution scientists have found that carbon is stored in the soils and sediments of the Ganges-Brahmaputra basin for a surprisingly long time, making it likely that global warming could destabilize the pool of carbon there and in similar places on Earth, potentially increasing the rate of CO₂ release into the atmosphere. According to the scientists the basin represents one of the largest sources of terrestrial biospheric carbon to the ocean. Organic carbon resides in the basin for anywhere from 500 to 17,000 years. Downstream, in the Gangetic floodplain, the longest residence times range from 1,500 to 3,500 years. This has huge implications for the global carbon cycle because the longer it is stored in the soil, the longer it is kept away from the atmosphere as CO₂.

The good news is that the Ganges-Brahmaputra basin "is not contributing rapidly to CO₂ in the atmosphere". The bad news is that global warming can make that happen. If carbon resides in the soil for thousands of years, as it does now in much of the Ganges-Brahmaputra basin, global warming can speed the transfer of carbon from soils and sediments to the atmosphere. It can do so by warming the region and stimulating microbial decomposition of organic carbon reserves there. (Press Release, Wood Hole Oceanographic Institution 031111)

Warming across Hindu Kush region greater than global average An ICIMOD study (Singh et al, 2011, *Climate Change in the Hindu Kush-Himalayas*) states that warming across the Hindu Kush-Himalayan region is greater than the global average of 0.74 degrees Celsius over the past 100 years. But the change is not evenly distributed. It is most pronounced in higher altitude areas like the central Himalayas and the Tibetan plateau. In Lhasa, for example, temperatures increased by 1.35°C between 1950 and 1980. A report by the International Centre for Integrated Mountain Development, Kathmandu on climate change shows that the impact of global warming has been greater at higher altitudes and more pronounced during the cooler months than in the warmer months. This imbalance narrows the seasonal variation in temperature, potentially favouring some plant species over others, and already making an impact on agriculture. The Hindu Kush region offers livelihood to 210 million people and provides goods and services to the 1.3 billion people living in river basins downstream who benefit from food and energy. (www.icimod.org/?q=5934)

Food production is one of the planet's important source of greenhouse gas emissions producing global warming and will be the primary victim with yields falling as temperatures rise and rainfall patterns shift, say authors of 'Virtuous Circles', a book dealing with climate change and food and water security. Most

sustainable food, water, energy and waste systems have been implemented in isolation. However, greater synergy can be obtained when ecological agriculture, renewable energy systems and sustainable water and waste management systems are all integrated. "This can contribute to food, water and energy security and also to financial security and poverty reduction through localised supply chains and fair trade initiatives," the authors write. Among the needed changes the book recommends is an end to current policies encouraging the "mining of soils" to maximise yields and switch to those favouring the management of nutrient cycle. ([Sage Update](#) 031211)

CDM HYDRO PROJECTS

Large Hydro in Himachal do not deserve CDM tag In their recent paper 'Offsetting Greenhouse Gas Emissions in the Himalaya? Clean Development Dams in Himachal Pradesh, India', authors Alexander Erlewin and Marcus Noller have assessed the effectiveness of large CDM hydro-projects in Himachal. According to their analysis of planning documents and expert interviews, the conclusion reached is "clean development" dams in the Himachal Himalaya fall short of achieving the goals of the CDM. Most projects are not in a position to compensate for emissions because they would have been built even without CDM support. Furthermore, "it is arguable whether CDM dams contribute to sustainable mountain development, because the consequences of their construction are the same as for many other ordinary large dams, that is, environmental damage and conflicts that arise from the reallocation of land and water resources. Our results suggest that the promotion of large hydropower projects through the CDM in its current form is a highly ambivalent strategy. Shortcomings in the regulatory framework of the CDM may be undermining the environmental and social integrity of the CDM at both the global and local levels." (BioOne, August 2011 <http://www.bioone.org/doi/full/10.1659/MRD-JOURNAL-D-11-00054.1>)

EC for relooking at CDM hydro credits The *Study on the Integrity of the Clean Development Mechanism* (www.ec.europa.eu/clima/policies/ets/linking/studies_en.htm) commissioned by the European Commission states that the EC should consider barring international offset credits from large-scale hydropower projects from the EU emissions trading scheme (ETS). In a statement published alongside the study, the EU executive's climate department says it will wait for the results of a review of the CDM being carried out by the scheme's executive board before deciding whether to introduce further restrictions. The EU has already banned credits from some large industrial projects from 2013 and credits from projects registered after 2012 that are not in less developed nations.

The review, lead by AEA consultants constitutes of briefing papers on a number of relevant topics. Briefing

paper on [Sustainable Development and Equity](#) states that ***'A series of six randomly selected PDDs for large hydro and energy intensive projects were examined. The results show that these categories of projects do little to contribute to sustainable development and social equity.'***

The paper quotes climate expert Barbara Haya ***"the CDM is blindly subsidising the destruction of rivers"***. It shows that large dams impose significant environmental and social damage. According to Haya's report, the 880 MW Campos Novos Dam in Brazil displaced 3,000 people, many of whom have not received promised compensation. Local project opponents were also subjected to arbitrary arrests and police violence. ***For social equity concerns, some project types, in particularly cement projects and hydro projects, are identified as having below average levels of social benefits.***

Briefing paper [Governance of the Clean Development Mechanism \(CDM\)](#) states that "some of the experts interviewed were of the opinion that the requirements of the directive (The European Union Linking Directive, Article 11b, 6 states: "In the case of hydro-electric power production project activities with a generating capacity exceeding 20 MW, Member States shall, when approving such project activities, ensure that relevant international criteria and guidelines, including those contained in **The Final Report World Commission on Dams (2000), will be respected** during the development of such project activities") should be adopted for all sizes of hydro projects (and not only large hydro) as standardization is of key importance for the longer term success of the CDM.

The insistence on following WCD guidelines is of special importance for India. However, it is of little effective impact if it just boils down to a mostly foreign consultant submitting a desk top review of the project. Particularly when the consultant has no idea of local ground realities, nor does the consultant have any transparency or accountability to the local communities. As is seen in the case of Rampur project in Himachal, a consultant has actually given such a desk top review report which quite erroneously claims that the ecologically destructive project adheres to WCD guidelines!

The report also highlights concerns of non additionality of hydro projects raised by SANDRP a number of times. 'Even if hydro projects pass the CDM additionality tests, in reality most large hydro power projects would have been implemented without CDM revenue support, with the main focus of this criticism being projects in China and India.' The Hydro section of the report concludes that ***"based on the data on new dams, 41% of the registered large hydro projects (>20MW) are of concern.*** It is to be noted that this may be an underestimation because all the additional 53.4% "run-of-the-river" are likely to be "large new dam" projects as well. (http://ec.europa.eu/clima/policies/ets/linking/studies_en.htm)

FLOODS

Flood-banks along Krishna causing conflicts

According to Irrigation experts and the River Conservator (Executive Engineer, Irrigation Department, Vijayawada), construction of a protection wall along the Krishna flood bank, supposedly to safeguard people living in the erstwhile riverbed and on the flood bank, is not advisable in view of the unpredictable floods in the Krishna. The issue of construction of the protection wall has become controversial with the Vijayawada East MLA who is in favor of the project and squabbling over it at a review meeting conducted by district in-charge with Vijayawada MP, who is opposing the project. The NH 9 was the original flood bank for the Krishna downstream of Prakasam Barrage. A proposal to have a permanent flood bank in the area was first mooted in the early 1950s, and there have been several subsequent demands. However, Irrigation experts say the construction of the protection wall will further narrow down the river, which now faces an erratic flood pattern, owing to climate change and several reservoirs in the upstream. The seemingly reduced floods due to upstream reservoirs led to encroachments in the riverbed. Though relocation may be difficult, experts say that rather than flood banks, relocation will be the correct decision in the long run. ([The Hindu](#) 161111)

RIVERS

Bhupenda's ashes immersed at Parashuram Kund

Ashes of legendary cultural icon late Dr. Bhupen Hazarika were finally immersed in his beloved Lohit River at Parashuram Kund amidst a huge gathering of people of Assam and Arunachal Pradesh.

Chief Minister and other dignitaries of Arunachal Pradesh and Assam attended the function. ([Assam Tribune](#) 151111) Ironically on this occasion to mark passage of a poet who loved free rivers, arrangements were made by Athena Demwe Power, the private company which is building dams on Lohit, along with a string of twelve dams, which, if sanctioned, will entirely change the character of the river, play havoc with its ecosystem and also affect Parashuram Kund. They also organised refreshments for the visiting officers and guests from Assam. The maestro is known for his melodious voice, his poems and also his strong bond with rivers. He sang about Ganga, Brahmaputra, Lohit and Dibang and once sang *'Lohit ke Kinarese Mississippi hoke, Volga se milene chala hoon, haan awaraa hoon'*.

Severe siltation of rivers in Goa According to local fishermen, siltation of Zuari and Mandovi Rivers is damaging bunds due to breaches while the overflow is also flooding water bodies. Breached bunds are resulting in the inflow of saline water in the fields, ruining crops stated Gomantak Adivasi Sanghatana president. The siltation of Mandovi River has been confirmed by a

hydro-graphic survey of India conducted in 2000. Fishermen along the banks of rivers employ traditional methods of fishing-nets, canoes, and stakes. But according to the secretary of All Goa fishermen's cooperative association, these stakes are often uprooted along with nets by passing ore-laden vessels. Senior fishermen plod on without alternatives, while many have been forced to divert to other occupations. Elderly fishermen have no choice as an alternative of raising crops on plateaus has been wiped off by construction activity. ([Times of India](#) 171111)

Hydel units and silt affecting Teesta flow According to a report by River Expert Dr. Kalyan Rudra, huge amounts of silt deposited on Teesta riverbed, combined with the hydel power projects upstream in Sikkim and Bengal have reduced the flow and volume of water in the river. According to the report, around **10 million tonnes (MT) of silt is deposited on the riverbed in monsoon**. The figure comes down to 2.5 MT in the lean season. According to Dr. Rudra "This deposit of silt reduces the water carrying capacity of the river. Further, the hydel power projects which came up upstream have also reduced the volume of water flow."

Chief Minister Mamata Banerjee had asked Rudra to find out if it was feasible to share Teesta water with Bangladesh without affecting the interests of north Bengal. Mamata had pulled out of Prime Minister Manmohan Singh's Dhaka trip in September, airing her objections to the Teesta water-sharing treaty that India was expected to sign with Bangladesh. "These constraints and other factors — one of them being the requirement of water at the barrage particularly during the lean season — have to be taken into consideration before deciding how much water can be shared with Bangladesh. We are also waiting for some data from the Central Water Commission to compile the final report," Rudra added. Accompanied by officials of the Teesta Barrage Project, Rudra visited Gajoldoba, Domohoni and Haldibari. He said he was yet to get data like how much water flows down from Sikkim and the volume carried by the Mahananda, Karala and Dharala before emptying into the Teesta. ([The Telegraph](#) 141211, for a very interesting 19 minutes documentary *Teesta Sutra*, see: www.ndtv.com/video/player/india-matters/india-matters-teesta-sutra/218696)

Rampant encroachments on Periyar River Periyar is the lifeline of Ernakulam, which depends on the river for drinking water and irrigation needs of the district. However, authorities are not paying attention to ongoing encroachments on the river. River Management Fund and the proposal to survey the boundaries of the river is gathering dust. It has been reported that around 200 apartment complexes with 80 to 150 individual apartments have encroached on the riverbanks, violating the Coastal Regulation Zone. These encroachments have resulted in erosion of the banks. According to local builders, "interpretation of the CRZ law is all the more

important. The law can be interpreted in many ways." Not only the real estate industries and individuals but the government itself has encroached upon the river. The District Tourism Promotion Council has built a hotel which blatantly encroaches on the river.

In keeping with the scheme of things, though environmentalists have been demanding a river survey to demarcate the boundaries for years, authorities continue to neglect these sane demands. Environmentalists allege that fund flow through River Management Fund has never been the problem for Periyar, with Rs. 100 Crore allocated last year for Ernakulam district alone. The district authorities say that they have been taking measures to protect the river. Ironically the only fund allocated till now by the authorities is Rs 17 lakh for constructing river protection walls and according to the district collector, "There is no ongoing project to survey the river." ([Times of India](#) 101111)

HYDRO PROJECTS

Fraudulent Hydropower companies in Karnataka

Forest officials of Sakaleshpura forest range of Hassan District in Karnataka have objected to a mini hydel project under construction in the region saying the developers have cheated and misinformed the government. They have lodged an FIR against the developers Maruthi Power Gen (India).

The developers have reportedly encroached into the pristine Western Ghat forests, illegally widened forest roads causing landslides, disposed waste that is obstructing the flow of Hongadalla River, affecting aquatic fauna, illegally constructed bridge against the Hongadalla River inside the forests, dumped debris in forests and constructed permanent labour quarters within forests.

The company is constructing a run-of-the-river mini-hydel power project in rainforest habitat which has several endangered wildlife species including tiger, elephant, leopard, flying squirrel, pied hornbill, Nilgiri marten all protected under The Wildlife Protection Act 1972. The large-scale blasting and felling of trees has been affecting the biodiversity. Wildlife conservationists have challenged this project in the High Court of Karnataka quoting procedural lapses in giving permission.

It includes purposely dividing the project into two separate projects of 18.9 MW and 19 MW to avoid the scrutiny of the Forest Advisory Committee, Ministry of Forests and Environment to which projects have to be forwarded if the diversion of forest land includes over 5 ha and above 25 MW. By doing this they are escaping EIA and also public hearing. This way, the developer is also fraudulently claiming subsidies meant for projects below 25 MW, when the project is not below 25 MW. ([Deccan Chronicle](#) 211111)

HYDRO PROJECTS IN HIMACHAL PRADESH

Himdhara study on Sutlej: River Under Arrest highlights the terrible environmental and social degradation brought about by string of hydropower projects on Sutlej in Himachal Pradesh including Rampur, Nathpa Jhakri, Baspa II and Karchham Wangtoo. According to the researcher of the report, Manshi Asher, tunneling and blasting in the river for these dams has led to drying up of the river bed, caused soil erosion, landslides, changed climatic conditions, dried up natural water springs and affected livelihood activities like apple cultivation. Starting from Kinnaur to Shimla, the river has been broken down into more than 30 pieces – each allotted to private and public hydropower developers. The report focuses on the possible impacts and glaring gaps in the sanctioning of the proposed 750 MW Luhri Dam project. Luhri Project will be spread over a length of 40 kilometers which includes 38 km long twin tunnels of 9 m dia, 86 m high dam, 10 bridges, 8 adit points, massive infrastructure construction including a helipad. More than 360 ha will be usurped by the project of which a large percentage will be forest. 6 tehsils of 3 districts will be affected.

Location and length of the twin tunnels of Luhri, longest tunnels of this kind in the world, have raised serious concerns. According to the report, EIA report submitted by SJVNL has failed to carry out a fair and detailed assessment of the environmental and socio-economic impacts and the impacts of the twin tunnels - **the most alarming of them being absence of nearly 80 villages above head race tunnel of 38 kms from the list of Project affected families**. The report strongly urges the MoEF to rework the EIA because of these serious lapses, conduct the Public Hearing again as the EIA was not complete when the original public hearing was conducted and carry out a detailed cumulative impact study of the Sutlej basin which is facing repeated assaults. Significantly, the authors have requested the members of the EAC to visit the power house and tunnel sites, interact with the villagers and only then come up with recommendations. A copy of the report has been submitted to the Ministry of Environment and Forests' Expert Appraisal Committee on River Valley Projects. (Himdhara Press Release 161211)

Luhri project faces protests: Petition in HC Around 200 residents of 10 panchayats of Karsog sub-division of Mandi district held a protest demonstration on Nov 24, 2011 against the Luhri hydro electric project. One of the main objections of residents is that the proposed 38-km long tunnel is one of the longest tunnels in the world to be built for a hydro power project. Nek Ram Sharma, secretary, Sutlej Bachao Jan Sangharsh Samiti, said that previous experience over Rampur & Nathpa Jhakri HEPs have proved it that tunnel construction has led to drying up of underground sources of water and have caused cracks in houses due to heavy blasting for tunnel

construction. These projects have led to rise in local temperatures besides loss of natural sources of water for drinking and irrigation permanently, he said.

He said that reduced agriculture and horticultural produce due to dust from mining and dumping activities and overall weakening of the foundation of these fragile mountains. Nearly 10,000 families residing in about 80 villages in Mandi and Kullu districts will be impacted by the twin tunnels and none of them have been included in the PAF list. Their demand that resonates in the entire Chuassi Bagad, Khanyol Bagada and Syaanj Bagada region of Mandi district. They have requested the Union ministry of environment and forests to refuse clearances to the project. These issues were raised at the public hearing held for the project in August 2011. In fact, a petition sent to chief justice of HP high court by the Samiti demanding that public hearing be cancelled, has now been admitted as a case. (The Times of India 251111)

Fish catch decreasing due to increasing silt from upstream hydro projects Due to heavy inflow of silt from upstream hydro projects, mining & other activities, the fish catch in the Bhakra reservoir has declined by almost 50% in 5 years. Last year the fish production stood at 600 tonnes, but this year it is about 448 tonnes and may not exceed 550 tonnes by March, the closing of the year. More than 22 cooperatives of fishermen feed on the reservoir. (The Tribune 171211)

Many hydropower projects had to be closed in July this year because of increasing silt in Sutlej. This silt inflow will also have many other consequences, including decreasing storage capacity of the reservoirs, less water for irrigation and power generation, more likely flood disasters in the downstream, falling groundwater levels and so on. As SANDRP had pointed out with photographic evidence (http://www.sandrp.in/hydropower/Violations_of_Environment_Norms_by_Four_Big_Himachal_HEPs-Photographic_Evidence_Feb_2011.pdf), main reason for this increased inflows is the illegal dumping of silt by the hydro projects including the World Bank funded Rampur project, and also due to the complete lack of intention, will or willingness shown by the MEF in ensuring compliance of environment laws.

Chenab basin projects face stiff opposition On Nov 18, 2011, over 200 residents of Tindi & Udaipur panchayats gathered at Nimu village of Udaipur sub-division in Lahaul-Spiti and rejected the proposal of 320 MW Shelli power project on Chenab River at the public hearing for the HEP. The proposed dam with 187 m height would submerge the agriculture and forest land of many villages, besides displacing the tribals from their villages which was not acceptable. Congress leader Jai Ram Thakur said, "The dam is being forced on tribal people against their wishes by the state gov. During a public hearing, all the people opposed the dam. Another dam proposed at Jispa in Todh valley is also facing stiff opposition of residents." (The Times of India 191111)

HYDRO PROJECTS IN NORHT EAST

WAPCOS DOES IT AGAIN: shoddy studies New report from the Water and Power Consultancy Services Ltd (WAPCOS) on impact of dams on Dibru Saikhowa presents (self) contradictory facts, while severely downplaying impacts of 3 mega hydro dams in Arunachal Pradesh on the biodiversity rich Dibru Saikhowa National park in downstream Assam. Looking at the irreversible ecological damage that can be promoted by reports like these, the report should not just be rejected, but the proponents should be held accountable for what they have reported.

Just as the Standing Committee of the National Board for Wildlife was examining the 1750 MW Demwe Lower Project on Lohit River for wildlife clearance, WAPCOS hastily came out with a Report **“Effect of Peaking power generation by Siang Lower HEP, Demwe Lower HEP and Dibang Multipurpose HEP on Dibru Saikhowa National Park”**.

This important study has been completed by WAPCOS in flat 6 days from the EAC (Expert Appraisal Committee) meeting held in Nov 2011 which raised uncomfortable questions about impacts of hydro peaking of the three projects on the downstream Dibru Saikhowa National Park. Shocked at several convenient assumptions and conclusions of the report and the fact that the report may have significant bearing on NBWLs decision, several civil society organizations, research organization, wildlifers and ecologists wrote to the NBWL and EAC. Here are excerpts from SANDRPs submission, the entire submission can be seen at: http://sandrp.in/hydropower/Comments_on_WAPCOS_study_on_effect_of_Hydro_peaking_of_dams_on_DSNP.pdf

Firstly, this study **contradicts Chapter 7 of the EIA study of Lower Siang Prediction of Impacts** which also tried to predict impact of dams on Dibru Saikhowa NP. Evidently, both the latest study and the Lower Siang EIA cannot be right. One of them is wrong presentation of facts and WAPCOS should clarify the contradictions.

Severely restricted scope of the study The study confines itself to the impacts on Dibru Saikhowa NP due to only one single variable i.e. **changes in water levels because of upstream dams**. However, Dibru Saikhowa NP (and biosphere reserve) is a part of the riverine ecosystem and is affected by any change in the riverine ecology. Changes in the upstream water quality, fish assemblages, zooplankton and phytoplankton, turbidity, etc., will have cumulative impacts on the biodiversity of the National Park and all these factors are severely affected by the multiple hydro projects and also peak generation releases. Considering the park in isolation, that too studying only the impact of water level changes on the park is unacceptable.

Ecological impacts of the drastically changed hydrological regime will have repercussions on all

ecosystem components like: Important bird areas and proposed Ramsar sites like **Chapories in Lohit, Piscean diversity** downstream of the dams, at and downstream of the confluence, which includes India's National Aquatic animal, the **Gangetic Dolphin, as well as Tiger corridors** which exist in the riverine islands and tracts forests at the base of hills of the Dibang, Siang and Lohit. The report is happily ignoring the Ramsar sites, National Aquatic Animal and National Animal, all at one go!

No Conclusions about impact on riverine & riparian ecology The study draws absolutely NO conclusions about how the flow fluctuation & changes in hydrological regimes (to which many species are very sensitive) will affect the fragile riverine biodiversity and in turn biodiversity in Dibru Saikhowa and surrounding areas. The impact of hydrological changes on aquatic and riparian life is very well documented and hard to miss.

Incomplete conclusions The study claims the level difference at DSNP when all three projects are peaking is estimated to be 2.34 mts i.e. 7.67 feet! This, at an average distance of 80 kms downstream! This will have drastic impacts on the ecology of the entire riverine stretch between dams and Dibru Saikhowa NP, which have not been assessed or addressed.

We take a strong objection to the statement made in the report that these level changes “will not have any impact on the park”. It is alarming to see such baseless, unscientific statements, that too without any sort of ground-truthing, field studies or discussions with ecologists and scientists who have been working on the area. It is obvious that a fluctuation of 7.67 feet will have huge impacts on the amphibians, fish, mammals and nesting birds which use the river in different ways along its length and also in Dibru Saikhowa NP.

No mention on cumulative impact of dams on Sedimentation/ erosion pattern The Dibru Saikhowa NP is strongly affected by sedimentation and erosion patterns of the rivers. All the three dams in the upstream will affect the sediment regime drastically and the impacts of the same needs to be assessed. **However, the present study does not address this issue at all.** WAPCOS has forgotten its own EIA prepared for Dibang which talks about impacts of sedimentation on DSNP!

An analysis of the impact of sudden water releases from all the three projects simultaneously at 1-in-100 year flood also is required. Similarly an analysis of impact of sudden annual release of silt from all the three projects simultaneously and separately is required.

Socio ecological impact of villages inside DSNP There are two forest villages inside the NP, with an approximate population of 1500. The impacts of hydrological changes on these villages in terms of transport, safety, etc., have been conveniently forgotten.

Contradictory data presented There are a number of contradictions in the data presented in the latest WAPCOS report from original EIAs and basin studies done predominantly by WAPCOS itself.

Distance of dams from DSNP boundaries Dibang EIA mentions that Dibru Saikhowa NP is 63 kms downstream of the dam site, however the latest WAPCOS report states that it is 87 kms from the dam site. One of the two studies is clearly wrong and needs to be held accountable for such wrong facts.

Eflows Without providing any source, the report claims on page 10 that eflows are 'assumed' as:

S No	Project	Min flow release, cumecs
1	Lower Siang	328
2	Demwe Lower	70
3	Dibang	50

Firstly, these are not eflows, but just one component in the regime: the lowest releases in the leanest periods (Jan/ Dec). Eflows stated in the EIA reports on which Environmental Clearance is based should be the logical basis for these figures, however, eflows figures in individual EIAs and latest WAPCOS Report differ.

Lower Siang HEP According to Eflows section of the Lower Siang EIA, discharge with base load is in the range of **396-917 cumecs** during Dec and Jan. It is also mentioned that "As the discharge with base load will be more than the environmental flows there will not be any requirement of releasing any additional discharge." However, the same EIA mentions "During lean season, to avoid drying of river stretch, it is proposed to operate the hydro electric project at minimum base load of 180 MW when the flows in the river are minimum. This will result in continuous minimum discharge of **350 cumecs**." (Sec 7.7, P 7-18)

Maximum design discharge According to table 7.2 (p 7-3) of the 'Prediction of Impacts of Lower Siang study', design discharge for Peaking of 2700 MW for 3 hours for lean season is considered as **4932 cumecs**, and **not 5462 cumecs** as assumed by the latest study.

Demwe Lower HEP According to WAPCOS Lohit Basin Study, the minimum flows during the period of Dec & Jan are 76.8 & 71.5 Cumecs. Minimum flows mentioned in the present WAPCOS study: 70 cumecs. According to the EIA, in Feb, this is further reduced to 66.1 cumecs.

Dibang Multipurpose HEP The EIA states eflows at 49 Cumecs for Nov, 55 Cumecs for Dec & 60 Cumecs for Jan. WAPCOS study states a figure of 50 Cumecs. Also, the timing for lowest minimum flow releases for Dibang (**Nov**, not Dec or Jan) does not coincide with leanest period of Demwe Lower and Lower Siang.

Assumptions about eflows As with all the above cases, there are serious issues about eflows assessed for Dibang Multipurpose Project. According to the EIA, Building Block Methodology has been adopted to allocate a mere 15% of average inflow during lean

season as eflows. On the other hand, for Lower Siang, which is an adjacent river basin, the Season III flows for Nov-March according to BBM are taken as "**20% of average flow during this period.**" What is the basis for this difference? Also, what is the basis for using these blanket percentages in the first place?

The manner in which eflows has been assessed by all the EIAs and basin studies (3 out of 4 conducted by WAPCOS) are alarming, which will have irreversible impact on the ecology of the region, including the Dibru Saikhowa NP. No independent experts from ecology and wildlife have been consulted. We appeal to the NBWL to raise objections about this basic issue which will impact the entire river ecology, downstream livelihoods & associated wildlife, including the DSNP and endangered species like Gangetic Dolphins & Golden Mahseer.

Considering these facts, the basic eflows calculations need to be verified by a team of independent ecologists, wildlife experts and hydrologists and impact thereof on the power generation and project viability needs to be assessed and CEA and others informed, only then can informed decisions regarding impacts of hydrology on biodiversity can be made.

Minimum-maximum discharge during lean season peaking The Prediction of Impacts Study, Lower Siang of WAPCOS considered range of maximum and minimum discharges during peaking at the confluence of Siang and Brahmaputra (approx, 7 kms upstream of Dibru Saikhowa NP) as **7610 Cumecs for 3 hrs and 663 Cumecs for 21 hrs** (Table 7.9 p 7-35).

The latest study claims this as: **2360.53 Cumecs for 3 hrs and 518.89 cumecs for 21 hrs** (P 16-c, P 26) at the first cross section of Dibru Saikhowa NP. WAPCOS should be asked to explain these gross contradictions and the EIA for Lower Siang should also be relooked at.

CONCLUSION WAPCOS has severely misrepresented the data to give a wrong picture to the NBWL about actual hydrological flow variations during peaking hours at Dibru Saikhowa NP & its impacts on wildlife, ecology & ecosystem goods & services. WAPCOS should be asked to explain this & if there are no reasonable explanations for the contradictions, all WAPCOS reports in this context should be rejected & an independent credible agency should be asked to redo them.

The very crucial role of an independent, credible agency with multidisciplinary panel of experts from the fields of ecology, wildlife, hydrology, geology, social sciences, etc., is imperative while making decisions of such gargantuan proportions, which have the power to create irreversible impacts on ecology and livelihoods. An agency, that too with a major conflict of interest like WAPCOS, should in any case not be relied on. Hence, considering these issues and several other submissions made, SANDRP urges NBWL and the EAC of the MoEF to reject the WAPCOS reports and clearances for the Demwe Lower HEP.

HYDRO PROJECTS IN UTTARAKHAND**MoEF approves project rejected twice by FAC in critical wildlife area**

The Union Ministry for Environment and Forests, the custodian of our environment **has intervened to give forest clearance to a 300 MW Alaknanda Hydro project of GMR group that was rejected twice by Forest Advisory Committee, once in May 2011 and again in Oct 2011!**

As the FAC minutes of May 2011 notes, the report from Wildlife Institute of India, commissioned by MEF following the CEC and SC recommendations on cumulative impacts of projects in Ganga basin had clearly said that the project should not be given clearance considering that:

- The Alaknanda-Badrinath hydro project is located in the buffer zone of Nanda Devi Biosphere Reserve which has two core zones the Nanda Devi National Park (NP) and Valley of Flowers NP. Both the core zones are inscribed as UNESCO World Heritage Site.
- The proposed Alaknanda-Badrinath & Khiron ganga hydro project falls in the same stretch and these may pose a serious threat to the existence and movement of species such as the snow leopard and brown bear.
- Hence, the construction of Alaknanda-Badrinath hydro project is likely to cause severe fragmentation and degradation of important wildlife habitats as well as habitat of above mentioned RET species (including 16 RDB plant species)
- Any further developmental activities in the form of proposed hydro projects on the river Alaknanda, Khiron ganga and Laxman ganga (Pulna hydro-electric project) will seriously affect the Outstanding Universal Values of the World Heritage Site due to cumulative impacts.
- The proposed Badrinath and Khiron ganga hydro-electric projects will seriously hamper the movement of species such as the snow leopard and brown bear in Nanda Devi BR as this is the only remaining stretch that is an important corridor for movement of these species. As the rare and endangered brown bear has its eastern most distribution limits in this area, the proposed hydro-electric and other developmental activities will further lead to habitat loss and degradation, and consequently shrinkage of the distribution range of this species.
- Thus, FAC decided, "FAC took a considered view of the matter. **The FAC recommends that prior approval of the Central Government in accordance with the Section-2 of the Forest (Conservation) Act, 1980 for diversion of forestland required for construction of Kotlibhel-IB, Kotlibhel-II and Alaknanda Badrinath Hydropower projects may not be accorded.**" (Emphasis added)

That conclusion was again repeated in the Oct 12, 2011 meeting. As noted by FAC, the WII report was following the CEC and SC orders.

WII report has accorded highest conservation value of 3 to the area affected by this project, among the five projects they has specifically assessed in their report.

But the ministry, over ruling the WII's elaborate reasoning and two rejections of statutory FAC, on Nov 8, 2011 accorded forest clearance to the project.

MoEFs clearance letter dated Nov 8, 2011, only states the usual conditions that any FC letter has, without even acknowledging the highest conservation value that WII accords to the affected area or all the serious impacts listed by WII.

SANDRP Wrote to the Minister, Secretary and other officials of the Union Ministry of Environment and Forests and Director General, Forests, about this on the 5th Dec, 2011. We have not received any response: Such wanton disregard about ecology from MoEF is indeed shocking. We need an independent inquiry to assess why this decision was taken and who played what role. Before that, this decision should be reversed immediately.

Protests against Singoli Bhatwari and Phata-Byung

People in Mandakini Valley have been opposing construction of Singoli-Bhatwari and Phata-Byung hydropower projects, with two groups had been sitting on fasts and preventing construction. Recently the Government arrested one group led by Jagmohan Jhinkwan and construction has started under police protection. In order to take the struggle forward, communities from Mandakini Valley have formed the Himalaya Mandakini Ganga Sanrakshan Manch a forum for debate and discussion about the issue. The Manch is asking all candidates in the forthcoming elections to specify their position on hydropower projects and advocate peoples stand. (Dr. Bharat Jhunjhunwala, 101111)

Hydropower plants affecting decisions regarding

Garhwal rail link A train route to Karanprayag has been planned and heralded as a must to improve the connectivity and tourism in this part of Uttarakhand. For India, a rail link to Garhwal region is of strategic importance because of its close proximity to Tibet. But the 125-km-long Rishikesh-Karanprayag proposed rail link, the foundation stone for which was laid in Nov 2011 at Gauchar jointly by Union defence minister A K Antony and Union railways minister Dinesh Trivedi. However, official of hydel companies are asking the railways to carry a fresh survey in keeping with hydropower projects planned. Similarly, the proposed 154 km long Tanakpur-Bageshwar rail link is already in jeopardy because of the 6000 MW Pancheshwar Dam. ([Business Standard](#) 111111)

WATER POLLUTION

Endosulfan poisoning rivers too Rampant and illegal use of endosulfan to catch fish has endangered the lives of hundreds living along Manu—a trans-boundary river that originates in Tripura. Illegal traders are mixing the highly toxic pesticide in the river upstream. Once mixed, the chemical is carried by the current all the way down to Bangladesh where the River Manu merges into the River Kushiara. This is causing severe impacts on the riverine ecology with several fish species have disappearing altogether, while many others becoming extremely rare. Locally extinct fish include Tiger fish, Dwarf Goonch and Ar-giant fishes that the river was once famous for. Even Sind Danio, Wallogo, Indian River shad and turtles which were commonly found even 10 years ago are now rare.

Due to its easy availability and cheap price, endosulfan has replaced the traditional use of herbs for fishing. Endosulfan has been banned or is being phased out in most countries, including the EU and the US. After years of resistance, in May this year, India also agreed to a phased out ban on the toxic pesticide, under an agreement signed by 127 nations of the Stockholm Convention on Persistent Organic Pollutants (POPs). ([Digital Journal](#) 091111)

Decentralised approach to sewage treatment Over a thousand crore rupees have been spent so far in the name of the Ganga cleaning since the inception of Ganga Action Plan (GAP) in 1985. The Cabinet Committee on Economic Affairs (CCEA) approved a project of Rs 497 crores for Varanasi in June 2010 under Mission Clean Ganga of the National Ganga River Basin Authority (NGRBA).

However, according to Bindeshwar Pathak, founder of Sulabh International and recipient of the 2009 Stockholm Water Prize "In the developed countries, the standard practice for the sanitary disposal of human waste is sewerage. Due to financial constraints and exorbitant maintenance and operational costs, sewerage is not the answer at present to solve the problem of human waste management in India. Out of over 4,800 towns and cities in India, only 232 have the sewerage system and that too partially. In developing countries neither the government nor the local authorities, or beneficiaries can bear total capital expenditure and operation and maintenance costs of centralised sewerage systems. These systems are also water intensive, with over two gallons water needed for each flush. **"Do we build huge dams and irrigation systems to bring in water only to flush it down into an expensive sewage system, all ending up polluting our rivers and ponds?"** asks Pathak. According to him, cleaning the Ganga or any other river is not possible with the existing system of sewerage and STPs, but it needs a decentralised system based on biogas generation technology that is not only cost effective but also easy in operation and maintenance.

BD Tripathi, Banaras Hindu University and member of NGRBA, also agreed with Pathak and said the **community based sewage treatment system with decentralised approach was the only way to clean the rivers in effective manner.** ([The Times of India](#) 101111)

Extensive Pollution of Ujjani reservoir Urban pollution, excess use of fertilizers and sugar distillery wastewaters are affecting the health and agro-economy of people whose livelihood is dependent on the Ujjani dam catchment. The catchment of Ujjani reservoir on river Bhima in Solapur district is known for its modern agricultural practices and cash crops.

A study conducted by Shristhi Eco-Research Institute, a Pune-based NGO, says that the loss is as high as 25% of livelihood income for individuals living in the urban and industrial areas of the catchment. Primary source of pollution in Ujjani reservoir is the high nitrogen input from sugar industry and distillery wastewaters and excess use of fertilizers. The rate of fertilizer usage in the state has increased from 14 kg per hectare in 1970-71 to around 75 kg per hectare (average consumption) at present. Sugarcane, which is grown on just 3% of the cultivable land in the Ujjani catchment, consumed the highest quantity of fertilizers and also water). The consumption of fertilizers for this crop has moved up from 226 kg in 1972-73 to 501 kg/Ha in 1990-91.

Unchecked pollution from Pune, which is in the upstream of Ujjani has resulted in eruption of hazardous gases (methane, hydrogen sulphide) from Ujjani reservoir many times in the year, indicating the deteriorated ecological health of the water body. It is estimated from the load calculations that about 25,000 tonnes of methane gas is generated in Ujjani reservoir annually due to accumulation of pollutants and another 25,000 tonnes from the sediments in the lake body. Villagers living along the polluted stretches of rivers in Ujjani basin downstream of Pune city are compelled to drink tubewell water, which is hard, or polluted river water, which is leading to water borne diseases. ([The Times of India](#) 161111)

WETLANDS

West Bengal State Environment Department forms a panel on Wetlands The state environment department has constituted a high-level expert panel to give recommendations to the government on ways to save and preserve wetlands, after various serious incidents linked to encroachments on water bodies. The Panel will be headed by river expert Kalyan Rudra. Dr. Rudra said that "In cases where buildings come up encroaching wetlands, it is not enough for a wetland to be compensated by creating another one elsewhere. The entire issue of protecting the environment is that a particular surrounding needs to be given priority." The panel will give its recommendations to the government within three months. ([The Times of India](#) 91111)

Atrocious: Police burn 200 floating huts at Loktak

The state government in Manipur is forcefully evicting families living on Loktak lake, a Ramsar site famed for its floating islands. The state police have been using brute force and have burned nearly 200 huts.

The officers from the Loktak Development Authority (LDA) and the Manipur state police carried out the burning down of 200 huts and it is being claimed that remaining 1132 huts will be treated in the same way. There are about 5,000 persons living in these huts within the Loktak Lake.

The burning down of the floating huts is in accordance with the provisions of the controversial Loktak Lake (Protection) Act, 2006, in particular Sections 19 and 20 of the Act, which divides the 236.21 sq km Loktak Lake into two zones - a core zone comprising 70.30 sq km, which is a 'no development zone', or 'totally protected zone', and a buffer zone of other areas of the lake excluding the core zone. In the core zone, huts and certain fishing practices are prohibited.

The eviction has led to the displacement of nearly 950 community members so far who have been living in these floating huts for generations. The number of affected families is expected to increase since the burning down continues. The fishing gears and nets of the communities, their only means to catch fish from the Loktak wetlands, were also burned, leaving the community with no means to find food for survival. Affected people on several occasions had been raising vehement opposition to the introduction of the controversial Loktak Protection Act, 2006, which they feared would break the age-old bond between the lake and its people. Indigenous peoples depending on the Loktak Lake for survival continue to demand the complete scrapping of the Act.

While the state government and LDA blame the indigenous communities who have been staying on the lake for generations, the impact of Ithai Barrage, which maintains the FRL of Loktak at an unnatural constant of 768.5 m has been conveniently ignored. This was done for the NHPC's Loktak Hydropower project. Such hydrological modification has profound impact on lake ecology, much higher in scale than local fishing. (For details: www.sandrp.in/rivers/Indias_wetlands_in_peril_Feb_2011.pdf) In any case, the local people have been staying in the traditional floating huts for generations and that has not lead to any adverse impact on the wetland.

On the other hand, encroachments, including those by government are going on in the Lamphelpat Wetlands where several government offices, military camps, Imphal Sewerage Treatment Plant, National Information of Technology buildings, National Games village, Langol Housing complex and the Police Housing complex encroach upon the wetlands. ([Write to Kill](#) 181111)

BANGLADESH

Tipaimukh It seems water sharing, between states or between countries is becoming increasingly difficult. There is a need for more transparent water sharing mechanisms which will be fair to the communities and ecology on both sides. In case of Bangladesh, even as the resentment over not signing the Teesta Agreement has not yet died down completely, another controversy has erupted over the dam on Barak river; a controversy that has been sparked by the news of the signing of the Agreement between National Hydro Power Corp and Manipur govt in Oct 2011 to build the Tipaimukh project on the Barak. This has given rise to protests against the dam in Bangladesh by the govt, the opposition as well as different civil society groups. ([Institute of Defense Studies and Analyses](#) 201211)

The opposition Bangladesh Nationalist Party chief Khaleda Zia wrote a letter to the Indian Prime Minister Manmohan Singh recently in which she raised a number of demands like stopping the Tipaimukh project and conducting a joint survey before India undertakes any activity. General Ershad of the Jatiya Party, a key ally of the ruling Awami League, staged a march from Dhaka to Sylhet against Tipaimukh. Bangladesh's water resource minister threatened to go to the international court on the dam issue if India did not stop work.

Professor Md. Khalequzzaman from the Department of Geology & Physics, Lock Haven University (USA) and originally from Bangladesh shares his perspective about the ongoing debate on Tipaimukh:

There has been a lot of discussion and debate about the potential impacts of the proposed Tipaimukh Dam on the economy and environment of Bangladesh in general, and on the *haor* region (wetland ecosystem in the north eastern part of Bangladesh, shaped like a bowl or shallow depression, also known as a back-swamp) in particular. The following points about potential negative impacts of the proposed Tipaimukh Dam on downstream region in Bangladesh have been formulated based on the knowledge of hydrology and published information.

- The Tipaimukh Dam is not the only dam in preparation, there are many (more than 100 in NE India) others, and Bangladesh Govt. needs to negotiate a long term integrated water resources management plan with India, where **all environmental impact studies are conducted as a joint venture project.**

- The Tipaimukh Dam will retain about 15 billion cubic meters of water in peak season, which is about 31% of the total flow of water that enters Bangladesh through Barak into Surma-Kushiyara-Meghna Rivers. It is completely unacceptable to Bangladesh that India will have unilateral control over 31% of the water in a shared river.

- Many people, including the Water Minister in Bangladesh government claim that they have all the necessary information on the Tipaimukh Dam and the Indian government has reassured them on numerous occasions India will not do anything to harm Bangladesh. This logic is unacceptable for many reasons:

1. India should not decide what is good for Bangladesh & her people without taking them in confidence. If India's intention was to help Bangladesh then they would have studied all environmental & economic impacts jointly with Bangladesh before initiating the project.

2. There are violations of laws, policies, and agreement that are practiced on shared international rivers. **The article IX in the Ganges Treaty clearly demands such co-operation and prior consent from all stakeholders.**

3. Indian govt issued environmental clearance to the project on 24 Oct 2008 and it is going ahead with the project despite serious objections from Bangladesh and Indian environmental groups (as well as indigenous people in Manipur and Mizoram). The project is yet to receive Forest Clearance.

In the Environment Impact Assessment, no study about the impact of the dam on, especially in the Haor region to understand the natural ecosystems that exist and depend on natural flow of water in Surma-Kushiyara-Meghna and their numerous tributaries has been carried out. Without such studies, it is impossible to conclude that the dam will not cause any harm to Bangladesh. It is unfair to expect 40 million people living in Haor regions of greater Sylhet and Mymensingh to rely simply on Indian assurance, not based on any scientific study.

- India claims that the no water will be diverted for irrigation from the project, and therefore, no harm will be done to Bangladesh. This is a flawed logic because:

1. Reservoir will have to be filled with 15.9 BCM of water, out of which about 6 BCM will be dead storage.

2. As result of the dam, the flow characteristics and water release schedule will be different as compared to the flow that existed before the dam was built. At this point, there is no information available or shared about the water release schedule which will be adopted on a daily basis for proper operation of the hydroelectric project. People in the haor region cannot rest with this uncertainty regarding water for their crops.

3. The life, livelihood, and ecosystems in Haor region have established equilibrium with the natural flow of the rivers. If this natural flow regime is altered, then farmers will not be able to prepare their land for boro cultivation on time, and the whole agricultural production may be jeopardized. On the other hand, if too much water is released in dry season then farmers will not have access to their land due to flat topography. In the rainy season, the opposite may happen. One can argue that there are people in downstream region in Assam & Manipur and India will not release extra water to cause flooding, but the extent of flooding and its impacts will not be known if no joint research is done.

- India has offered Bangladesh to invest in the project and to buy electricity from the project, which is not acceptable on the following counts:

1. The fact that India has signed an agreement with three Indian entities and set a deadline of 87 months for completion of the project and has issued environmental clearance without involving any study about Bangladesh first, raises serious doubts about joint venture.

2. There is no treaty between India and Bangladesh about joint management of water resources in Barak-Surma-Kushiyara.

3. Bangladesh should find other means to produce electricity-not by destroying the agriculture and ecosystem in the haor region.

- Bangladesh Advisor to Prime Minister on Foreign Affairs, Gawhor Rizvi recently (Dec 12, 2011) wrote that since the Tipaimukh Dam is 140 miles away from Bangladesh border its impact will be minimal on Bangladesh. The truth couldn't be far from this. Barak-Surma-Kushiyara is a continuous river and it empties in the Bay of Bengal through the Meghna River. Therefore, any interference with water flow will be felt all the way to the Bay of Bengal. For example, the Farakka Barrage is over 100 miles from the shoreline in Bangladesh, but its negative impacts on the salinity intrusion and the water level in the Gorai and other rivers in SW Bangladesh is documented.

A similar situation will occur in the greater Mymensingh and Sylhet districts should water be diverted from Barak through any barrage (such as the proposed Phulertal Barrage in Assam). Salinity may encroach up the Meghna-Kalini-Kushiyara-Surma-Gorautra rivers farther inland, impacting the agriculture and fisheries in parts of Habiganj, Kishoreganj, Netrokona, Sunamganj, Sylhet districts.

- As a part of FAP-6 study, it was concluded that if the Tipaimukh Dam is completed then the flow in Bangladesh will increase in summer months and will decrease in rainy season. This finding is questionable.

1. Since India has not completed the dam and there is no water release schedule as yet, not even a tentative one, it is impossible for each to this conclusion.

2. Any departure from natural flow regime will mean adjustments for farmers and fishermen in the Haor region in terms of timing for preparation of their agricultural fields, planting of seeds, and harvesting the crops. The people of Bangladesh will have to rely on the decision of Indian authorities for their share or necessary amount of water needed for their life and livelihoods.

The natural flow of the Surma-Kushiyara-Meghna is required for the well being of the people and existence of Bengal delta which has been fed by water and sediments of Ganges-Brahmaputra-Meghna river system. Let the rivers flow freely.

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## BHUTAN

**Joint meeting on Hydropower** At the 6<sup>th</sup> Empowered Joint Group Meeting, Bhutanese Minister of Economic Affairs, also the Chairman of the Joint Group Meeting established for accelerating the construction of the hydro projects said that “**generating 10,000 MW by 2020 is a herculean task.**” The Indian delegation was led by the Additional Secretary, Ministry of External Affairs, Govt of India. ([Bhutan Today 100611](#))

**Workers in bad shape at Thorthormi GLOF** Three Bhutanese youth lost their lives while they were on their way to lower the water level at Thorthormi, the biggest and the most dangerous glacial lake in the Bhutanese Himalayas, which could cause an unimaginable catastrophe if not tamed. One of the biggest natural threats facing Bhutan in face of Climate Change is the GLOF. The glacial floods in 1994 claimed about 20 human lives & destroyed villages & farmlands along the Punatsangchu basin when the Lugye Tsho, a much smaller lake than Thorthormi, gave way.

Bhutan has been one of the first countries to come up with its National Adaptation Plan of Action which was necessary under the mandates of the United Nations Framework Convention on Climate Change, and also the first country to get monetary assistance from the LDC Fund under the Adaptation Fund of the UNFCCC under which the global environment facility is funding Nu 130 m for the Thorthormi project.

But the Bhutan government has not contributed any money for the project. More than 340 Bhutanese workers involved in lowering the water level are given a meager daily wage of Nu 500 which is less than double the daily minimum wage of Nu 300 in the country and no compensation for working in knee-deep icy waters at 4,300 m. The workers work with bare hands and three workers have already died because of altitude sickness. ([Biodiversity Media Alliance 010611](#))

**‘Climate Summit for Living Himalayas’** Bhutan hosted this summit in Thimaphu on 19 Nov 2011. The Summit was presided over by the Prime Minister of Bhutan, Lyonchhoen Jigmi Y Thinley while Ministers and officials from Environment Ministries from Bangladesh, Bhutan, India and Nepal took active part and adopted a declaration on behalf of their Governments wherein a regional ‘framework of cooperation’ was agreed upon. Dr. Tishya Chatterjee, Secretary, Ministry of Environment and Forests, represented India.

The ‘Framework of Cooperation’ is aimed at implementing regional cooperative actions to build resilience to climate change in the southern watersheds of the eastern Himalayas by: Ensuring energy security and enhancing alternative technologies; Securing the natural freshwater systems of the Himalayas; Ensuring

food security and securing livelihoods; and Securing biodiversity and ensuring its sustainable use. A mechanism to implement the ‘Framework of Cooperation’ has been agreed upon.

Looking at the hydropower boom in this Himalayan region and the documented impacts of large dams on climate change, it was expected that the Declaration will set guidelines about the unplanned and rampant setting up of hydropower dams. However, it has failed to do so. On the other Hand, Area I of the Framework on Cooperation deals with Ensuring Energy Security and Enhancing Alternative Technologies talks about ‘Increasing use of renewable energy resources and clean technologies’, a current misnomer for Hydropower. Some welcome Objectives include:

### Mainstreaming Climate Resilience in Energy Systems: Activities:

- Establish network to share climate information
- Establish an Eastern Himalayan Institution on Climate Change and Energy
- Establish mechanisms to conduct research on impact of climate change on energy system and demand
- Promote incorporation of climate change adaptation strategies in energy planning

### The Declaration talks about **Securing the Natural Freshwater Systems of the Himalayas**: Activities:

- Enhancement of ecosystem management to minimize the impacts of climate change induced disasters
- Develop effective approaches and actions concerning disaster management
- Promotion of traditional water conservation techniques with modern methods to increase water use efficiency
- Lessons, good practices and appropriate technologies shared in the region to improve water use efficiency

Interestingly, countries also shared papers on their individual efforts and plans to mitigate and adapt to Climate Change in fields of Water, Food, Energy and Biodiversity. While Country Paper on Water of Bhutan succinctly points out to problems of planning and water availability that can be faced by hydropower dams in face of climate change, India paper fails to mention anything about hydropower. ([www.bhutanclimatesummit.org](http://www.bhutanclimatesummit.org))

## NEPAL

**West Seti Hydropower project dropped** Nepal government revoked the license of the West Seti hydropower dam project in July 2011. The project had struggled for 16 years to find funding. It is the second largest dam in Nepal to be cancelled, after the Arun 3 hydroelectric project, which was dropped after the World Bank withdrew from project financing in 1995. The combination of local and international pressure and strong arguments against the project from legal, human rights, environmental and economic perspectives have been the key to the success of the West Seti campaign.

The West Seti Dam was a 750 MW project proposed for the Seti River in western Nepal. The project license was awarded in 1994 to the Australian multinational company, Snowy Mountains Engineering Corp. Under the terms, SMEC was allowed to export 90% of the power to India even though more than 60% of the Nepali population has no electric power and those who do face up to 18 hours of blackouts daily in the dry months. Nepal was to receive 10% of the project's electricity along with a nominal royalty. At one time both the Asian Development Bank together with the China National Machinery and Export Corp and China Exim Bank were involved as co-financiers, but all of them pulled out.

The campaign to stop the project raised several issues of concern. Local issues concerned the effects on the dam-affected population, flawed public hearings, inadequate environmental impact assessment and poor mitigation plans. The relocation of 30,000 people from the highlands to the plains of the Terai in Kailali, the heartland of the indigenous Tharu people, was another major issue and the Tharu people were vehemently opposed to the project's resettlement plan. The project did not envisage training and employment for the local people, nor was there any provision for the compensation and resettlement of landless oustees or those with no formal entitlements to their traditionally owned land, or for those dependent on fishing. Making power available to India before Nepal was also a strong point in opposition.

According to Ratan Bhandari of the Kathmandu-based Water and Energy Users' Federation-Nepal, while the popular movement has succeeded in stopping the West Seti Dam for now, such projects never disappear for good. Nepal's govt is now trying to revive it, and the Chinese govt has expressed an interest in providing financial support. (International Rivers)

## PAKISTAN

**IRSA for more dams** Describing water flowing downstream Kotri as a wastage, the Indus River System Authority (IRSA) has requested Prime Minister Yousuf Raza Gilani to immediately move on construction of reservoirs to ensure additional storage of about 22 million acre feet (MAF). According to IRSA, about 12 MAF of water was 'lost' downstream Kotri during Kharif this year while an average of 31 MAF was going into the sea every year. The IRSA president said that Diamer-Bhasha, Bunji and other hydropower projects had the potential to produce 17,000MW of electricity.

One of the reasons stated for building these dams was that "Whenever Pakistan raised objection at an international forum over Kishanganga Hydropower Project or other controversial projects being constructed by New Delhi, India says that Pakistan is throwing 31 MAF into the sea every year. Therefore, it is imperative for Pakistan to build more dams."

This seems to be a very dangerous justification for embarking on large dams which can lead to more harm than good. It seems Indus Delta will suffer again. Discharges from the Kotri barrage have been declining sharply from historic discharge of 150 MAF, to 0.72 MAF in 2006. In 2003-4, **lowest outfalls in the history were recorded at 0.28**. This has wrecked havoc with the ecosystem goods and services of the once-productive delta regions, affecting livelihoods of farmers and fishermen, especially from the Mirbahar and Jat communities. It is estimated that 1.5 million people from the region have migrated elsewhere as ecological refugees. Mangroves in the region, which protect the coastline and act as fish nurseries, have reduced from 260,000 ha in 1980s to 73000 ha currently. In places like Ketu Bunder, mud flats are eroding at a rate of 14 m per month. Already, the salt water ingress has reached 54 kms in the main river channel and aquifers as much as 80 kms inland have become saline. ([Asian Human Rights Commission 100611](#), [The Dawn 011011](#))

**ICA prohibits permanent work on Kishanganga** The International Court of Arbitration has restrained New Delhi from undertaking any permanent dam works on or above the Kishanganga/ Neelum river bed in Baramulla, Jammu, that might inhibit the flow of the river. According to the interim order, "Except for the sub-surface foundations of the dam...India shall not proceed with the construction of any permanent works on or above the Kishenganga/ Neelum riverbed at the Gurez site that may inhibit the restoration of the full flow of that river to its natural channel,"

However, no restrictions have been placed on India from going ahead with construction of other components of the dam, like the water conductor system, coffer dams, the temporary by-pass tunnel and excavation below the river-bed level. As per international law, India will do so at its own risk in case the final order provides for changes in the project design. Pakistan had sought full moratorium on the entire 330 MW Kishenganga project under construction in Baramulla district. New Delhi filed a counter-petition to Pakistan's objections in Nov 2011.

The order states that for the duration of the proceedings up until the rendering of the Award, it was open to India to continue with all works relating to the project except for the restriction placed. "India may utilise the temporary diversion tunnel it is said to have completed at the Gurez site and may construct and complete temporary cofferdams to permit the operation of the temporary diversion tunnel, such tunnel being provisionally determined to constitute a 'temporary by-pass' with the meaning of Article I (15) (b) as it relates to Article III (2) of the [Indus Waters] Treaty."

The interim order urged India & Pakistan to undertake joint inspection of the site to monitor the implementation of the court's direction. Both parties may also submit their agreement or disagreement on the implementation of the order.



In the dispute over the project, Pakistan maintains that it has the rights over the western rivers including Jhelum (of which Kishenganga is a tributary) and diversion of waters by India for its project on Kishenganga will adversely affect its project on Neelum river (as Jhelum is called in Pakistan). India, holds that it is well within its rights under the Indus Waters Treaty to deliver waters into a tributary to the extent that the then existing agriculture and hydroelectric uses by Pakistan are not affected. India maintains that so far Pakistan has not given details of any agriculture use and its hydroelectric use is also non-existent.

In an address on 'India's water relations with her neighbors', former Secretary Shri. Ramaswamy Iyer says, "Even if tomorrow Kashmir is resolved, water will remain a core issue between the countries". He further said that while it could be argued that Pakistan is raising water sharing issues as a diversionary tactic for its inter-provincial conflicts, **a joint study by experts on both sides on whether there is indeed a reduced flow on the western rivers could erase the perception that India has not been a fair and just upper riparian.** He also suggested as confidence-building measures studies on the impact of the 33 Indian projects on the Western rivers as the cumulative impact could be bigger than the sum of the individual projects. ([The Hindu 310811](#), [250911](#), [The Dawn 100911](#), [The Tribune 260911](#))

## **\$2.2 B Kohala HEP contract to China company Illegal**

Transparency International Pakistan has said that ECC (Economic Coordination Committee) has violated Pakistan's Public Procurement Regulatory Authority (PPRA) Ordinance 2002 and Public Procurement Rules (PPR), 2004 in award of \$2.2 Billion, 1100 MW Kohala hydropower project contract to M/s China International Water and Electric Corp (CWE), which may cause an estimated loss of Rs 577 Billion in 30 years. Similarly awarding 7000 MW Bunji dam project on Build, Operate & Transfer basis following the signing of Memorandum of Understanding to another Chinese company would also result in huge losses to the Govt of Pakistan.

Transparency International has sent a letter regarding these issues to Federal Minister for Finance requesting the minister "to perform his obligatory duty to stop Ministry of Water & Power (MOW&P) from destroying the fabric of governance and proceeding with an illegal act of awarding \$2.2 Billion contract to M/s CWE.

The events at PPIB and ECC confirm that these organisations have been trying to circumvent rules, procedures and law of Pakistan to award the contract without open tender, as was approved by the Prime Minister and agreed by the Government of Azad Jammu & Kashmir in 2005. Both these Hydro projects are being delayed by the MOW&P and PPIB only to circumvent PPRA and PPIB Rules. The letter states that the onus of the loss to exchequer completely rests with MOW&P,

PPIB and the Cabinet. It also states that sovereign guarantee to Chinese Company for buying the electricity is being provided by the Govt of Pakistan, which may be in trillions of rupees. Transparency International Pakistan has requested the Minister to direct the procuring agencies WAPDA & PPIB to invite public tenders. It is possible that in public tendering, the cost of the two projects may be substantially less. ([The News 11111](#))

## **Pakistan faces Climate change induced floods**

Pakistan has been warned of frequent floods of disastrous nature like the ones that battered the country in 2010 and 2011 in the Indus River owing to rapid glacier retreat and shifting of monsoonal zones by about 100 km towards northwest regions. In a recent communication it sent to the govt, the Asian Development Bank called for continuous focus on flood preparedness instead of an episodic and temporary reaction to the post-flood situation. The communication is based on assessments of a research and consultation carried out by a task force set up by the Friends of Democratic Pakistan.

Research shows that the monsoonal zone of Pakistan (a region that receives 65 per cent of total monsoon rains) has shifted 80-100km from northeast (upper Punjab and Kashmir region) to northwest (Khyber Pakhtunkhwa and northwest Punjab regions). This suggests that the location of heavy rainfall events during the monsoon will move from northeast to northwest Pakistan. As a result, areas along the western rivers of the country Indus and Kabul will be extremely vulnerable to flood episodes similar to the one experienced during 2010.

Pakistan has been advised to follow the Bangladesh example where a combination of early-warning systems, preparedness and adaptation of public buildings to be used as safe-houses has resulted in dramatic reduction in loss of human lives due to flooding and cyclones. Pakistani authorities have been advised to take actions over a protracted period, including watershed management by rehabilitating lost forest cover and preventing further cutting of trees. They have also been asked to evolve a community based disaster risk management system to create awareness about vulnerabilities and preparedness and maintenance of the protection infrastructure. ([Dawn 221211](#))

## **BURMA**

**Myitsone dam on the Irrawaddy dropped** On 30<sup>th</sup> Sept 2011, the Govt of Burma announced the suspension of its plans to build the massive 6000 MW Myitsone dam on the Irrawaddy River in the Northern Kachin State which was to export 90% of its electricity to China and built with Chinese assistance. The Myitsone project was a part of a seven-dam cascade that represents a \$ 20 billion investment by China.

The dam's reservoir, roughly the size of Singapore, would have submerged important historical and cultural

sites at the Mali and N'mai Hka rivers, as well as what is widely recognized as the birthplace of Burma. The dam site was located in a region that is recognized as one of the world's top biodiversity hotspots and a global conservation priority and was poised to inundate approximately 766 sq. km. of land and forested area and cause irreversible damage to Burma's key river system, as well as to downstream rice paddy communities.

The campaign against the construction of the Myitsone dam brought together conservationists, scholars, and political activists including Aung San Suu Kyi, and had become a serious test for the new civilian-led, military-backed govt. There have been many objections to the entire process related to the dam, including the quality and independence of the Environmental Impact Assessment, the resettlement process and the role of the project in exacerbating the long-standing conflict between the ethnic Kachin people and the military govt. Myitsone was being developed jointly by the state Myanmar Ministry of Electric Power, the privately-owned Asia World Company of Burma and the China Power Investment Corp.

This is the first time that the Govt of President Thein Sein has responded to public pressure. While announcing the decision to suspend the dam he said in a message to the Parliament in the capital Nay Pyi Taw: "We have to respect the will of the people as our Govt is elected by the people. We have a responsibility to solve the worries of the people so we will stop construction of the Myitsone Dam during our current govt." According to a diplomatic source in Rangoon, "There have been signs of increasing unease among some ministers in Nay Pyi Taw (about the Dam). Maybe some political leaders do not want their legacy to be one of irreparable damage to the Irrawaddy."

Kachin is a troubled part of Burma and earlier this year, the Kachin Independence Organization had terminated a 17-year ceasefire agreement with the Govt in protest against the project and warned the Govt that it would forcibly block the project undertaken by the China Power Investment Corp.

Importantly, the dam is located less than 100 km from a major fault line, posing a risk to the lives of hundreds of thousands of people by flooding Kachin State's largest city, Myikyina. According to Ms. Suu Kii, another danger was the "serious problem" from a weakened flow of the waters of the Irrawaddy and intrusion of salt water into the delta. The Burma Rivers Network, formed by groups representing the local communities, has called on the Govt to immediately cancel the other six dams planned on the Irrawaddy source rivers, which, it said, "will have the same devastating impact on the country." However, the battle is far from over for the local groups. ([BBC 300911](#), [International Rivers 300911](#), [Sri Lanka Guardian 041011](#))

**India financed dam to displace 45000** According to Burma Rivers Network and environmentalists in Burma,

India financed Tamanthi dam project in Burma, could displace up to 45,000 people in the country's northwestern Sagaing division. The 1200 MW Tamanthi dam will create a reservoir the size of Delhi, 80% power generated is to go to India. More than 2,400 have already been forcibly relocated since construction began in 2007, and that figure is set to rise as both govts push ahead with the \$ 3 billion venture. According to the Kuki Women's Human Rights Organisation, which represents the Kuki ethnic group that populates areas of northwestern Burma and India, thousands already relocated were denied proper compensation by the Burmese govt. Women and children relocated to new villages are facing huge difficulties over food – the new settlement is located up north and there is also a shortage of water. The protesters handed a letter to India's NHPC, as well as the Burmese embassy in New Delhi. ([Burma Rivers Network 091212](#))

## CHINA

**Three Gorges Dam triggered 3,000 earthquakes** A study by seismologists at the China Earthquake Administration (formerly known as the China Seismological Bureau) indicates that the massive Three Gorges dam on the Yangtze River "significantly increased" seismic activity along the dam's reservoir. The study helps to explain the numerous landslides that have caused havoc in the region, necessitating the evacuation of 300,000 people.

According to the study seismic monitors around the reservoir and in Hubei Province registered 3,429 earthquakes between June 2003 (when inundation of the reservoir began) and Dec 31, 2009. "*This represents a 30-fold increase in frequency over the pre-dam period,*" according to Patricia Adams, of Toronto-based Probe International. "*The earthquake activity especially increases when the dam operators rapidly increase or decrease the level of water in the reservoir.*"

One earthquake reached magnitude 4.1 on the Richter scale. It occurred as the dam authorities were attempting to fill the reservoir to its maximum height of 175 metres above sea level. Chief engineer of the Sichuan Geology and Mineral Bureau warns that "strong earthquakes could occur in the future as the reservoir fills because the micro-fractures, caused by the large number of micro-earthquakes, could make the area dangerously prone to a strong earthquake."

Large reservoirs are known to trigger earthquakes in a phenomenon called "Reservoir-induced Seismicity." In a [report](#) of 19 dams in China that have suffered from RIS, 15 have geological conditions similar to Three Gorges. The Chinese State Council, the country's federal cabinet, acknowledged that preventing geological disasters is one of the problems with the dam that "should be solved urgently." ([Probe International 010611](#))

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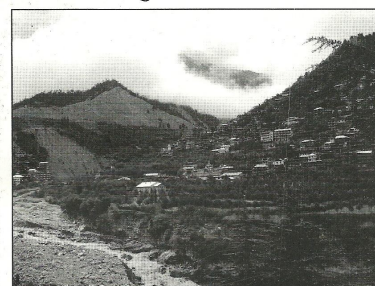
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