



Lead Piece Why Gandhi Sagar is an Oxymoron

The strong case for reducing the FRL of the Chambal Dam

There is no doubt a very strong case for reducing the Full Reservoir Level of the Gandhi Sagar dam from 1312 feet to 1295 feet as it is likely to make available about 40000 ha of land that is otherwise not available. The reduction in the effective reservoir level won't reduce the current benefits of the dam.

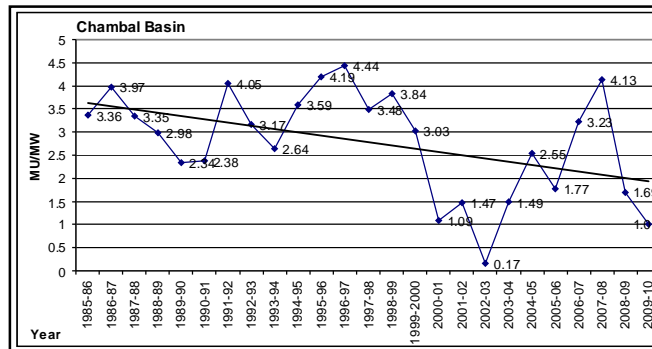
This was one of the main resolutions passed by the convention organized by the Gandhi Sagar Vishthapit Sangh at Rampur in Neemach district in Madhya Pradesh during Nov 18-19, 2010. The convention was organized on the occasion of the 50 years of the Gandhi Sagar dam. On Nov 19, 1960, when Nehru commissioned three of the five 23 MW units of the then second largest reservoir of India, the project was named as Gandhi Sagar. The dam site holds the statues of Gandhiji to identify the Gandhi in the name of the dam, though the date Nov 19 also happens to be birth day of Mrs Indira Gandhi.

But the people at the convention took strong exception to calling the project Gandhi Sagar. They said that Gandhi did not stand for anything that the project signifies for the affected people, districts and the region and hence the name Gandhi should be removed from the name of the dam. In a resolution passed on Nov 19 at the public meeting, they said the dam may be called anything else (Hitlersagar was suggested by way of loud thinking) but Gandhi.

Indeed Gandhi Sagar is an over sized dam. It has a submergence area of 72300 ha according to the publication on Large Dams in India from Central Board of Irrigation and Power. But such a huge reservoir with catchment of 22533 sq km predictably filled to capacity only in five years in five decades.

Gandhi Sagar is part of the Chambal basin projects that includes Ranapratap Sagar, Jawahar Sagar and Kota Barrage in that order as we travel downstream from Gandhi Sagar (see map of the Chambal Valley on the

next pages). The combined hydropower capacity of the three projects (Kota barrage is basically for diverting



water into the right bank and left bank canals, it does not have hydropower component) is 386 MW. The hydropower generation from the three projects has been steadily and steeply declining as seen from the above graph showing the Million Units generated per MW installed capacity for the complex of three projects for

the last 25 years from 1985-86.

The affected people were also pretty angry that the promises made when the project was proposed and their lands taken away are yet to be fulfilled. And the affected people are much worse off than they were before displacement. In fact, the stark injustice meted out to them is evident from just one figure. The compensation that they were given for the lands taken for the project was around Rs 100 per acre.

Continued on p 2

INDEX

The strong case for reducing the FRL of Gandhi Sagar Dam	1
Sustainable water management in Konkan under threat	5
Kalpsar: Modi's hankering for illusory legacy of mega water project	8
Indian Express Campaigns for Big Hydro in North East	10
PILs lead to the framing of Policy on Sand Mining for Maharashtra	13
India's 1 st Climate Impact Assessment Report	14
Global Temperature could rise by 4 C by 2060	15
Protests against Kalu dam near Mumbai	16
Past misdeeds haunts Kol Dam	17
Serious Water Hazards of Shale Gas Exploration Policy	18
Thermal Merchant Power Plants: Threat to Ecology and Livelihoods	20
Capacity Trading in Power Market	21
South Asia: IDSA task force report on water security	22
Pakistan: The World Bank's Indus indictment	23
Poem: अब बनें गे बांध आं सूके	24

Continued from p 1

SALIENT FEATURES

Name of Dam	Gandhi Sagar	Ranapratap Sagar	Jawahar Sagar	Kota Barrage
Year of completion	1960	1970	1973	1960
Nearest city	Mandsaur	Kota	Kota	Kota
State	Madhya Pradesh	Rajasthan	Rajasthan	Rajasthan
Type of Dam	Masonry	Masonry	Masonry	Earthen
Height above lowest foundation level	62.17 m	53.8 m	36 m	51.9 m
Length of dam	514 m	1143 m	393 m	551.68 m
Gross storage capacity	7322.75 mcm	2898.69 mcm	52 mcm	112 mcm
Effective storage	6797.485 mcm	1566.52 mcm	13.2 mcm	83.2 mcm
Reservoir area	723 sq km	198.29 sq km	10.705 sq km	4.84 sq km
Catchment area	22533 sq km	24576 sq km	26880 sq km	
Purpose of the dam	Storage, hydropower	Storage, hydropower	Hydropower	Irrigation
Installed Capacity	115 MW	172 MW	99 MW	-
Full Reservoir Level, m	399.9	352.9	298.78	-
Minimum Draw Down Level, m	381	343	295.78	-
Design head, m	45.5	49.7	35	-
Tail Water Level, m Max/Min	353.27/343.51	Not Available	NA	-
Max discharge through turbines (total)	311.5 m ³ /s	396 m ³ /s	368 m ³ /s	-
Water speed m/s	3.6	NA	3	-
Designed spillway capacity	21238 cumec	18408 cumec	21240 cumec	21225 cumec

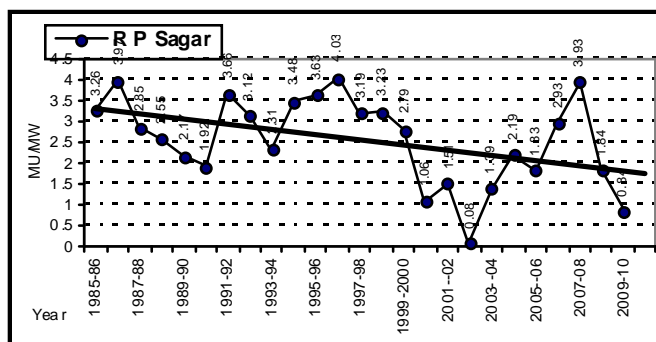
Source: National Register of Large Dams. 2002 and 2009 edition, Central Water Commission, Central Bureau of Irrigation and Power

Today when the displaced people have to apply for temporary cultivation rights for just one year for the same land that once belonged to them, they have to pay Rs 500 to 1000 per year and that too after going through the bureaucratic harassment including applying for such rights and bribing the irrigation officials in many cases every year.

The affected area has not got the electricity or water supply benefits from the dam. Rampur town, which was promised a future of *chaman* (heaven) by no less a person than former prime ministers Nehru and Shastri, stands destroyed as a commercial hub of the surrounding villages and the only industry in the town has been closed down as it did not get regular electricity. The story is not different from other big dams of India, but it once again underscores the reality that big dams do not equate to development.

Pathetic power generation performance The graph on the previous page shows how the combined generation of the three projects (Gandhi Sagar, Rana Pratap Sagar and Jawahar Sagar) is declining over the last 25 years for which we could get figures from Central Electricity Authority under RTI and through monitoring the website of CEA over the years. The graphs for individual power generation from the three projects over the same period are given here. They show that power generation from each of the project has dropped by over 25% during the last 25 years. No questions are being asked why this is happening. Increased water use in the upstream and siltation in the reservoirs give only part of the answers.

There is another way to look at the power generation performance of these dams. The projects were given techno economic clearances based on promise of



certain generation that is called design generation and that is supposed to be achieved in at least 90% of the years. In the table below we have given how the projects have performed in this respect.

Power Generation Performance of Chambal Dams

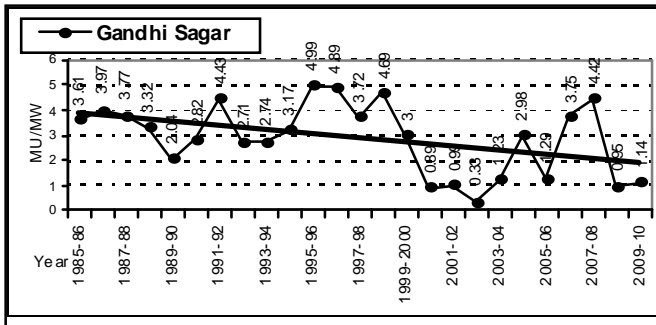
	Gandhi Sagar	Rana Pratap Sagar	Jawahar Sagar	Total
Design generation	420	459	298	1177
Actual generation	114	240	200	554
% under performance	72.86	47.7	32.89	52.93

Generation figures in Million Units per annum

It is clear from these figures that the performance of the project has been very poor. The three projects collectively were expected to generate 1177 million units or more in 90% of the years. From the official generation figures of last 25 years, the projects have collectively generated 554 MU at 90% dependability, which means the actual generation has been below the even 50% of the design generation.

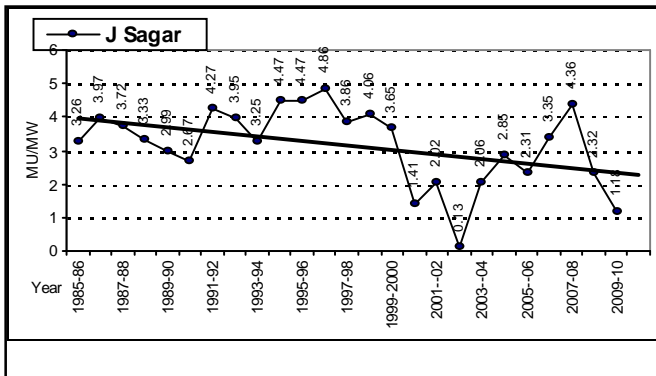
The % under performance for Gandhi Sagar, Rana Pratap Sagar and Jawahar Sagar has been 72.86%, 47.71% and 32.69% respectively. Gandhi Sagar has been the worst performer in this respect in the last 25

Ram Pratap Gupta, who has done a remarkably detailed research on the various aspects of performance of the Gandhi Sagar Dam over the last two decades, there was a clause in the inter state agreement between Madhya Pradesh and Rajasthan, under which Madhya Pradesh agreed that no surface water storage or irrigation projects will be taken up in the Gandhi Sagar catchment districts that includes parts of Neemach, Mandasaur, Ratlam, Ujjain, Indore, Dhar, Shajapur and Dewas in MP.

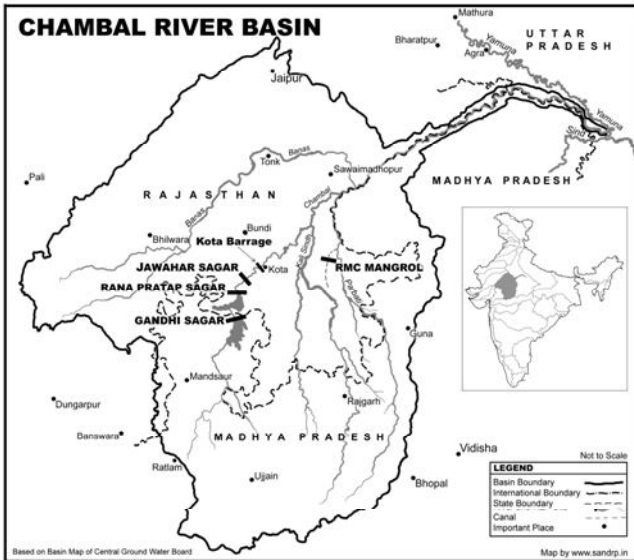


years.

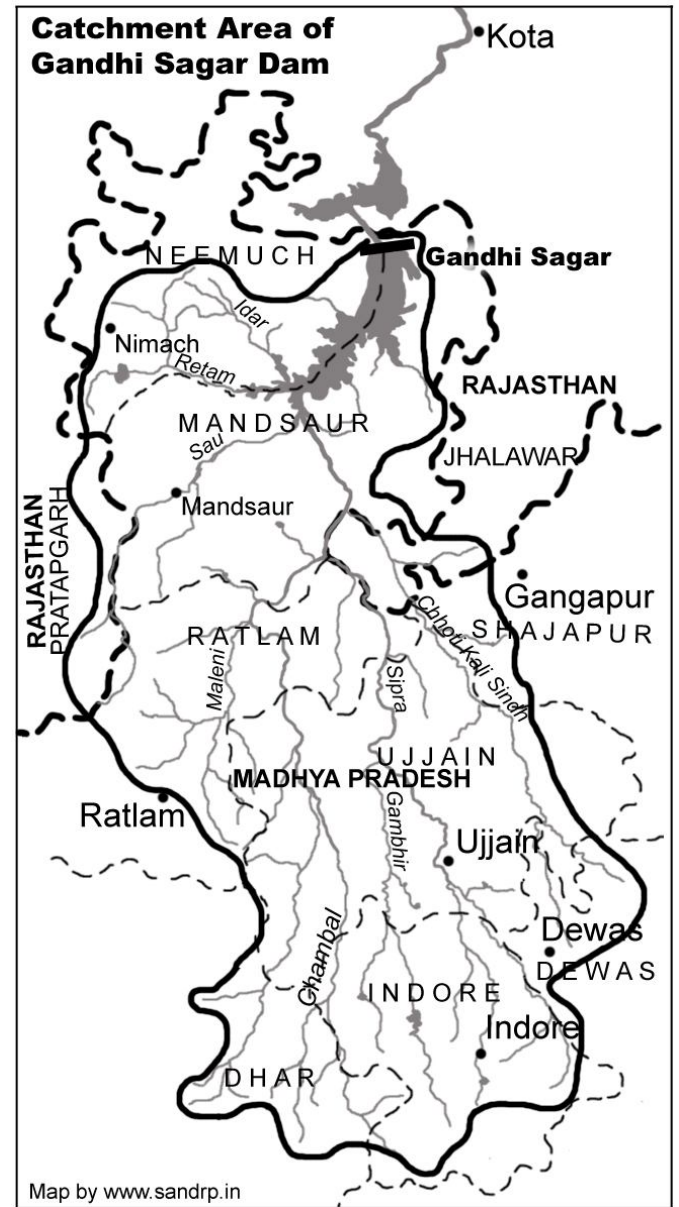
Pity is, such performance appraisal has never been done for any of the over 4700 large dams built by India in last 63 years. So the question of asking, as to why this is happening, who is responsible, what lessons one can learn etc does not even arise.



Desertification of the catchment Another impact of the



project has been in the catchment area of the Gandhi Sagar Dam. As pointed out at the convention by Prof



However, there has been major groundwater use developed in these districts over the years. Thus, as per the latest (May 2009) reports from the Central Groundwater Board, while the Annual replenishable groundwater resource of Indore district is 569.02 Million Cubic meters, the actual net groundwater draft there is 594.26 MCM. The figures for Mandasaur (708.68 MCM vs use of 759.66 MCM), Shajapur (523.2 MCM vs use of

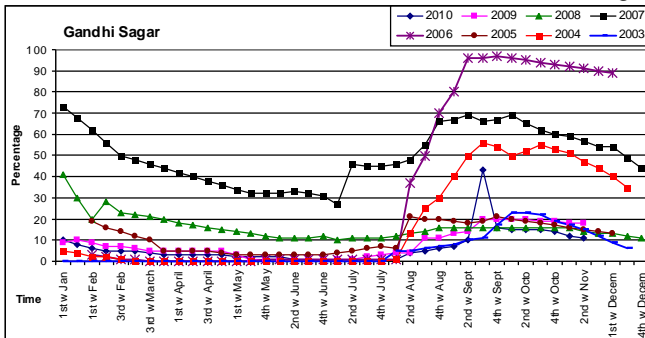
594.39 MCM) and Jhalawar (a Rajasthan district, whose small part is in Chambal basin, 430.82 vs use of 453.02 MCM). It seems that the catchment of Gandhi Sagar with annual average rainfall of 860 mm is seeing depletion of groundwater levels due to over exploitation on the one hand and lack adequate recharge of the groundwater through local water systems on the other hand.

District wise annual rainfall in Gandhi Sagar Catchment districts (mm)

	2005	2006	2007	2008	2009
Neemuch	746.5	1352	501.6	813.2	681.7
Mandsaur	744.6	1443.3	817.7	708.2	725.6
Ratlam	774.8	1634.3	1228.9	652.1	756.9
Ujjain	669.4	1768.4	1125.2	639.6	817.9
Indore	723.1	1234.2	960.5	670.6	965.1
Dhar	559.9	1083.4	1160.6	687.3	727
Shajapur	642.5	1628.3	1060.9	692.7	785.9
Dewas	609.6	1276.5	1013.3	404.6	779.7
Jhalawar	661.8	1087	726	618.7	689.2

Source <http://www.imd.gov.in/section/hydro/district/rainfall/districtrain.html>

The rainfall in the catchment districts of Gandhi Sagar

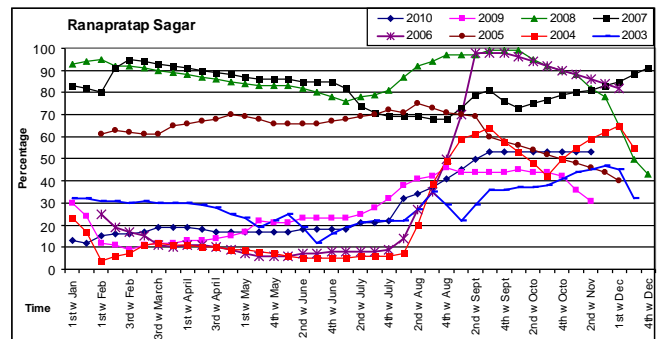


dam is given above for the last five years. The long term data shows that the annual rainfall has not reduced significantly. However, the reservoir filling graphs for Gandhi Sagar and Ranapratap Sagar, based on data available for the last eight years shows that Gandhi Sagar dam was filled to the capacity only once (2006) in these eight years, while even the much smaller Rana Pratap Sagar was filled closed to the full capacity only thrice in eight years. This shows how hugely overdesigned these two reservoirs are. It is clear that there is a strong case for reduction in the FRL of Gandhi Sagar from current 1312 feet (399.9 m) to 1295 feet (394.72 m). At 1295, the reservoir capacity will be 55% of the current reservoir capacity, which too got filled up only thrice in last eight years for Gandhi Sagar.

Unsafe dam There is another reason also why the FRL of Gandhi Sagar dam needs to be reduced. As pointed out by Prof Gupta at the meeting, the Central Water Commission had declared in 1990 that considering the probable maximum flood that the dam is likely to receive in view of data available after the dam was completed, the spillway capacity of the dam is much lower than such floods it could receive. In such a situation, the operation of the dam at current FRL becomes unsafe and there was need to increase the Maximum Water level to 1316 feet. But Madhya Pradesh and others concerned

disagreed with the proposition of higher MWL since the dam was filling up just once in a decade even at current FRL and there was no justification in putting additional area at risk of submergence. The CWC then concluded that in that case, the current dam operation is much more risky or in simpler words, it is unsafe.

Here it may be added that the Gandhi Sagar dam has 10 spillway gates and nine sluices for releasing flood. However, the sluices have not been operated for many years since the dam operators found that they could not close it when they opened it on a previous occasion. This further reduces the flood release capacity of the dam. In these circumstances, if the FRL of the Gandhi Sagar dam is reduced to 1295 and dam is so operated that till the end of the monsoon, sufficient space is left empty below the new FRL, than the operation of the dam would also become safer.



The reduced FRL of 1295 feet would also be appropriate considering the 75% dependable inflow expected into Gandhi Sagar Dam. Approximately 35-40 000 ha of land that would become available can be distributed among the affected people, and this will a long way in undoing the injustice done to them.

Conclusion There was palpable anger at the Rampur meeting. The dam had displaced some 228 villages and no worth while rehabilitation has happened. On the contrary, people have only suffered for 50 years. It may be good idea for the Rajasthan, Madhya Pradesh governments and also the central government agencies of Planning Commission, Central Water Commission, Union Ministries of Environment and Forests and also Water Resources to accept this proposal rather than allow the movement of dam affected to snowball into a demand for decommissioning of the dam. An important demand made by the convention at Rampur was that the government should set up credible, independent commission to review the performance of all aspects of the Chambal basin projects and consider the various options for the projects. Such a review can help arrive at a way to arrive at appropriate decision in this regard. It is important that this reasonable demand is accepted immediately so that the dissatisfaction of the affected people of Chambal Valley is addressed and not allowed to snowball into something more problematic.

Himanshu Thakkar
(Maps, tables and graphs by Swarup Bhattacharya)

Sustainable water management in Konkan Under threat

Parineeta Dandekar

At the first sight, *Daarche Paani* ('water at the doors') appears unreal. on a small flat plateau called 'Sadaa' in Konkan, an elegant cobbled walkway leads a puzzled visitor to stairs carved in stone, which go down to an ancient grove, and here is an intricate system of tanks, channels and falls which supplies water to the Panderi village and goes down as a free flowing stream, to irrigate a plantation of areca nut, pepper and mangoes in a village called Gudaghe. When I visited the place, I could see three eminent visitors, a silent lady washing her load of clothes, a fairy bluebird splashing at a tank and a huge moon moth in one of the trees.

Lateritic plateaus in Konkan act as sponges for water storage, and numerous small community-managed water harvesting systems have evolved here for centuries downhill these plateaus. In keeping with its tag as one of the biodiversity hotspots of the world, this part of the Western Ghats is teeming with rare biodiversity and endemic species. This is a story about such systems in one of the villages.



Stone walkway and ancient mango trees leading to Daarche Paani. Photo: Parineeta Dandekar

Lateritic plateaus in Konkan act as sponges for water storage, and numerous small community-managed water harvesting systems have evolved here for centuries downhill these plateaus. In keeping with its tag as one of the biodiversity hotspots of the world, this part of the Western Ghats is teeming with rare biodiversity and endemic species. These plateaus are home to rare herbs and plants, a sanctuary to fauna like leopards, civets, pangolins, and a huge store of drinking water, which is rare in konkan, despite the heavy showers it receives. Fortunately, the severe slopes, innate instability of the land and relatively less 'development' make this area unfavourable for big dams, and small community led water supply schemes are the lifelines of the region.

Daarche Paani consists of seven tanks, each built in stone at a different level. The first tank receives continuous fresh water from an underground spring and is called "*Devache Taake*" (tank of the gods"). This is

generally untouched and is worshipped with locally grown produce every time there is a wedding or a birth in the village. *Devache Taake* then overflows through a channel to a drinking water tank, from where the women (thankfully, now also men) collect water. Washing and bathing near this tank is not allowed. It is cleaned daily

by the first and the last user. Then is the tank for the cattle. This one is bigger, with gently sloping margins. It is very interesting to see these margins, which allow small animals as well as birds to use the tank, without the perennial danger of a thirsty being falling in and drowning.



Its difficult to capture the system in the tangle of trees. Photo: Parineeta Dandekar

(This is heart-breakingly common in our national parks, where the deep pools constructed by the Forest Department result in deaths of many birds, especially owls). Then are the tanks for cleaning and bathing. These have specially built stone platforms. These tanks then converge into a channel, which flows down and irrigates an areca nut and pepper plantation downstream. Further, this small spring joins the river and meets the Vashishti estuary, just 2 kms from here.

None from the village of Panderi know who actually built the system and when. It supplies water even in the dry

months of April and May and what's more, though a village water supply scheme has reached the Panderi village, people still prefer drinking water from *Daarche Paani* as it is supposed to taste (and look) much better and also is more reliable than the scheme. The entire system is located on land owned by one of the plantation owners in the Gudaghe village and once, when he decided to sell the mango trees guarding *Daarche Paani* to a logging contractor for Rs. 3000, the villagers intervened. They strongly protested against cutting of trees in this region, and when the landowner was adamant, the villagers, most of whom are marginal farmers, actually raised money to pay off the landowner and cancel the deal to protect the trees! Similarly, when the Zilla Parishad declared its intention of building a concrete water tank here and generally 'cleaning up' the place, (which entailed cutting the trees) the villagers strongly protested in the Gram Sabha and the plan was cancelled. One cannot blame them when one sees the terrible condition of the jackwells maintained by the Zilla Parishad.

The place is cleaned daily and there are strict rules to be followed, which are hand painted on a board, which says: "Cutting of trees, littering, bathing in upper tanks and eating tiffins in *Daarche Paani* is not allowed". And these rules are adhered to quite strictly.

The system which supplies water to a population of more than 300 throughout the year and flows down to irrigate a 5 hectare plantation in a different village, is completely maintained by the villagers. In the summer months, they complete any repairs needed. Funds are raised from the village and *shramadan* is a way of life.



A spring tank built by the villagers at Temkar Waadi. Civets and Leopards are regular nocturnal visitors to these tanks. Photo: Parineeta Dandekar

Similar systems, though on a smaller scale are seen in all neighbouring waadis, where the water coming from the *Sadaa* is harvested through tanks and channels built by the waadi. Though Zilla Parishad Water schemes and hand pumps have reached some of these waadis,

(which is note worthy, looking at the remote location) they are not reliable and the villagers rely heavily on the traditional systems. All water for drinking is collected from these systems only. When cyclone Phyan hit this region in November 2009, water supply was totally disrupted for more than 18 days and the population was entirely dependent of these community systems and individual wells.

The above spring tank is built at Temkar Waadi, it is a 4 kilometers trek from *Daarche Paani*. The waadi is situated just below the ridge of the mountain range and is a one hour climb from the main road. When I asked the villagers about the financing of these schemes, they seemed puzzled, it seemed natural for them to build and maintain such systems, without expecting help from any government schemes or projects.



A springwater collection system at Kolhe Waadi in summer. The shallow well contains clean drinking water. Photo: Parineeta Dandekar



Spring tank at Derde, hidden in the forest. Photo: Parineeta Dandekar

A remarkable system has evolved at a neighbouring village of 'Derde'. Derde, situated next to the Vashishti Estuary, on the top of a mountain, is hidden in Forests and mango plantations. Its forests boast of twenty-strong

hornbill flocks and its huge trees have been the nesting ground of various eagles for many years. Much of this is changing, with the entry of shipyards near its foot, which have destroyed an entire mountain and has destructed hectares of mangrove forests.

Derde had a perennial spring running through it, which supplied water till the months of April. April, May and June are the most difficult months in Konkan due to paucity of water. 40 years back, a group of ambitious youth from Derde built a small spring tank at the base of a spring and protected its source. They did not only develop a hardware system, but a system of rules for using this tank. The village contributed to the construction of the tank and people who could afford, took individual water connections from the tank to their homes. Those who could not afford individual connections had to come to the tank to fetch water. This task was divided between men and women. In the summer months, piped water was stopped and everyone had to come to the tank for collecting drinking water and washing/ bathing, to avoid wastage. If water scarcity became severe, only drinking water was to be collected from the tank and the women (only them this time!) went to the nearby river for washing. The system works the same way even today.

Already, the systems and the entire water sovereignty (at least drinking water) of the region is jeopardised due to the proposed string of power plants in Konkan region. Gudaghe-Panderi village is proposed to have a 1200 MW combined cycle gas based power plant , situated right on the plateau, which is the biggest natural water harvesting structure of the area.

of these systems provide water not only to humans, but also to animals and birds, many of which are rare, endangered and endemic to Western Ghats, and all this is many times cheaper, more efficient and ecologically benign than conventional dams and canals approach.

While, the intention is not to eulogise these systems which are extremely case-specific, one thing is certain, these system have evolved with the society and respond to their needs and requirements perfectly. Any hasty attempt to 'revamp' or upgrade these systems can result in more harm than

good. Already, the systems and the entire water sovereignty (at least drinking water) of the region is jeopardised due to the proposed string of power plants in Konkan region. Gudaghe-Panderi village is proposed to have a 1200 MW combined cycle gas based power plant , situated right on the plateau, which is the biggest natural water harvesting structure of the area. Derde village is witnessing huge forest cutting and ecological destruction with the onslaught of Shipyards and mining in the region.



Spring tank with individual water connections

Photo: Parineeta Dandekar

These systems may not be as grand and decorative as the ones in Gujarat or Rajasthan, but while most of the bigger systems are now facing disuse and neglect, these systems are still functioning are being maintained and managed by the community. These are not just tanks and channels, but a part of an intricate system, with its own code of conduct and negotiating mechanisms. Most

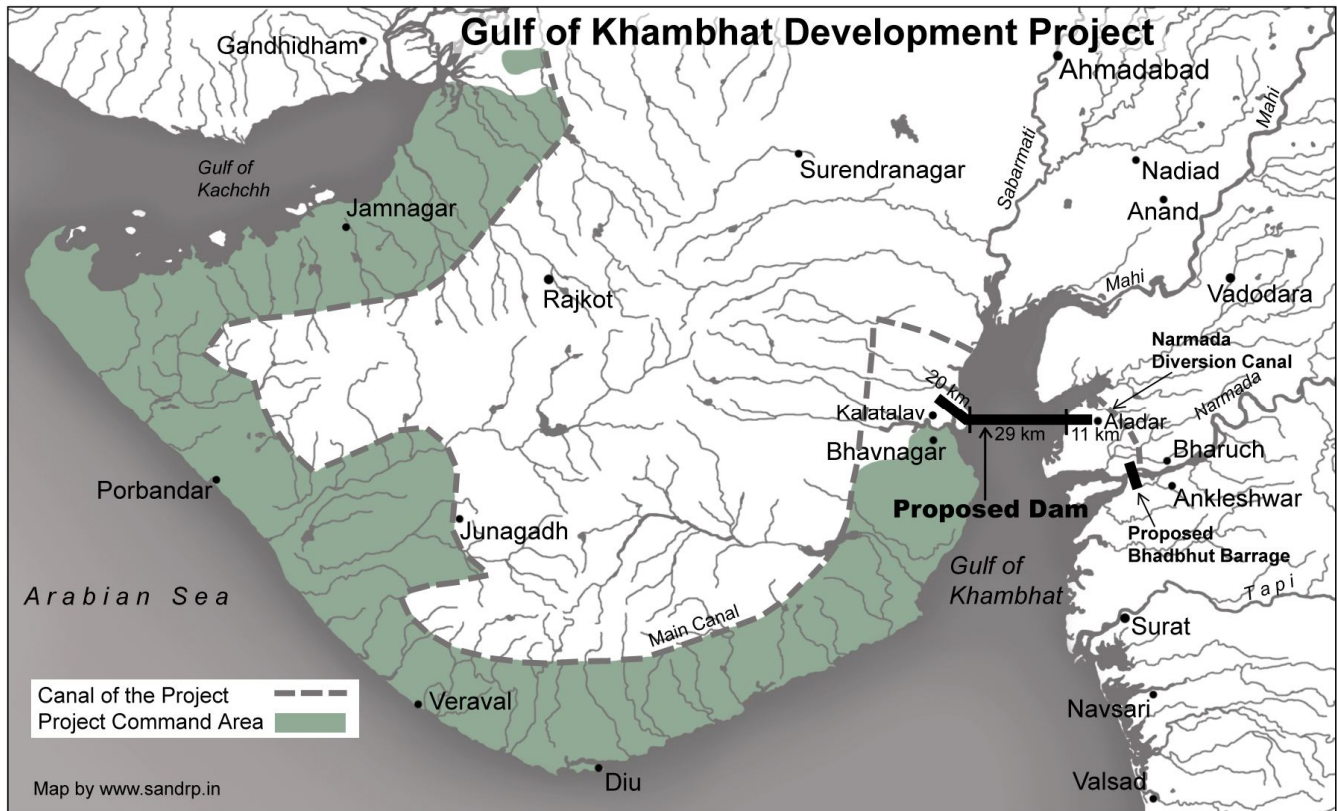


Small spring supplying water to the temple tank in Asud, Dapoli

Photo: With thanks from meghaclicks.blogspot.com

Unfortunately, these find no mention in either the super fast EIAs being performed in the region or scientific documentation. It is high time we pay heed and due respect to these small, appropriate and beautiful systems which provide invaluable services to humans and non humans without causing displacement, environmental destruction or moral and material corruption.

~~~

**Imagining Kalpsar:****Modi's hankering for illusory legacy of mega water project**

Gujarat Chief Minister Narendrabhai Modi may love it when called *Chhote Sardar*, there he does not mind having *Chhote* or small. But he has been hankering for a project that will leave behind a legacy that matches size of his self portrait, such a project cannot be *Chhote*. So the project has to be BIG and it preferably should be a water project. Sardar Sarovar cannot fit that bill, there are too many other claimants for it and it is too costly, controversial and crisis ridden. *Sujalam Sufalam* that Modi started has left largely a legacy of corruption, so that also won't do.

One likely candidate for such a legacy project that Modi has been eyeing for long is the Kalpsar Project.

It is indeed HUGE, Humungous project, larger than anything India has ever undertaken. In fact it is also proposed to be one of the biggest in the world. The basic proposal (the latest version, the versions have been changing pretty rapidly) is to construct a 30 km long dam (one of the longest in the world) across the Gulf of Khambhat between Bharuch and Bhavnagar districts. It is expected to create a reservoir of 2000 sq km area, over five times the area of Sardar Sarovar, the reservoir capacity is expected to be over 10 billion cubic meters, that is larger than the SSP reservoir capacity. The water from the reservoir whose level is expected to move between 5 m above mean sea level and 5 m below mean sea level and is supposed to be pumped over the

height of 65 m to feed a 15000 cusec canal that is going to be 660 km long, the longest canal of India. The reservoir is supposed to trap the water of twelve rivers that empty their water in the gulf, including Narmada, Mahi, Sabarmati, Dhadar and some Saurashtra rivers. Its claimed benefits include drinking water supply of 1400 Million cubic meters, providing irrigation to 10 lakh ha, reclamation of 2 lakh ha of saline land, generation of tidal power, reducing road distance between South Gujarat and Saurashtra, tourism, among others. Nothing of this dimensions have ever been undertaken in India, nor possibly in the world if we look at the objectives of Kalpsar.

The project has been under study for some years now, the earliest detailed study dates back to 1988. But the studies have been rather patchy and unconvincing, necessitated frequent change in scope of the project. For example, till recently the dam was to be a 64 km long affair, now it has been reduced to 30 km length.

Netherlands has built some long dykes (for some details, see:

<http://www.nethcold.org/nethcold/index.php?c=damsinNL>), but they are basically for protection from sea surge, creation of sweet water reservoir from sea was not one of their objectives. The longest of them is 32 km long Afsluitdijk dam constructed in 1932, about which the Netherlands Commission on Large Dams say, "At 32



kilometres long and 19 metres high at its highest point, the Afsluitdijk ranks eleventh among the world's largest dams." In fact, following the construction of some of these dykes that lead to opening up the sea through sluice gates so that the saline water can enter the reservoir and rejuvenated the biodiversity. Take this statement from the Nethcold website, "The declining salinity of the water led to high mortality of the flora and fauna in Lake Grevelingen, which was created as a result of the dam. Therefore, in 1978, a sluice gate was constructed in the dam to flush the lake with seawater. The lake has since developed into an important nature conservation area." Similarly for the Haringvliet Dam the site says, "As a result of the dam, the characteristic tidal flora and fauna has largely disappeared in the lower parts of the rivers. Recently, the government decided to gradually restore the tidal influence." In case of the 8 km long Eastern Scheldt Storm Surge Barrier 65 gates had to be installed in 1986 following public pressure to keep the inlet open to sea "to conserve nature and the fishing industry." This reversal of policies to let the sea and rivers meet may have some lessons for Gujarat if they were open to such lessons.

South Korea has built a 33 km long Saemangeum dam project in Yellow sea, that has been seen as a huge failure and embarrassment, and it was basically for reclamation of 28000 ha of land. It has failed as no freshwater reservoir could be created and no land could be reclaimed for agriculture as per the original plans, see for details: <http://www.birdskorea.org/Habitats/Wetlands/Saemangeum/Downloads/Birds-Korea-SSMP-Report-2006-2008.pdf>.

But what Gujarat plans is much bigger and more different than any of these. And Modi seems to be banking on creating a legacy of sorts through this project. He himself initiated "A survey to determine the boundary of Kalpasar dam" on Feb 5, 2004 (see: <http://www.narendramodi.in/pages/developmental-initiatives>). In May 2007 he travelled to South Korea to see for himself the Saemangeum project mentioned above (see: <http://news.oneindia.in/2007/05/17/modis-team-signs-mous-in-korea-1179415045.html>). More recently he told a journalist that he would like to see Kalpasar as his legacy. Its another matter that Dr Anil Kane, who considers himself pioneer of sorts to push this project has been trying for many years to somehow ensure some progress on this project.

Then what is the problem?

The first BIG problem is that of hydrological feasibility. All the rivers that flow into the proposed reservoir area are already dammed and water is over committed from those rivers. To illustrate, about 80% of the water in the proposed Kalpasar is supposed to come from Narmada River. Narmada has only 23 Million Acre feet of water annually, but the Narmada Water disputes tribunal has allocated 9 MAF of water to Gujarat, assuming Narmada has 28 MAF Water. And Gujarat has already planned to

use about 15-20 MAF water from Narmada considering the command area, cropping patterns and non agriculture water use pattern planned. So even the surplus monsoon water from Narmada is not likely to be available for Kalpasar. Second big issue is that whatever little water flows from these rivers into Gulf is mostly highly toxic. There are also serious questions about the geological feasibility of constructing this earth and rock-filled, longest dam in the middle of the surging sea, the foundation is yet to be gauged, the issue of salinity that exists in the gulf water and the soil underneath and how much more will leak into the dam. The reservoir with shallow depth and huge area will have huge evaporation losses, and pumping all the water into the canals through 65 m + height would be hugely energy intensive. The claims of project generating some 5500+ MW tidal energy is very doubtful and feasibility questioned by experts. The project will also destroy the coastal and deltaic fisheries, wetlands. India, as a signatory of Ramsar convention, cannot destroy coastal wetlands in such vast area without raising international issues, the project will also need clearances under the Coastal Zone regulations.

The bill of the project is appropriately large, considering the size of the legacy that Narendrabhai wants: Rs 54000 crores as per preliminary estimates. Modi won't be happy to know though that the Ministry of Environment and Forests' Expert Appraisal Committee on River Valley Projects declined to approve the terms of reference for the Environment Impact Assessment for the project in Sept 2010. The Committee raised many questions about feasibility of the project, including lack of a pre feasibility study. The seven member team from Gujarat, lead by Dr M S Patel, Secretary, Kalpasar Dept that went to MEF for this meeting has been told to come back with a lot more information before even the Terms of Reference for the project can be sanctioned. As we had written to EAC in July 2010 before the meeting (see: [http://www.sandrp.in/dams/Why\\_KALPSAR\\_project\\_should\\_not\\_be\\_cleared\\_for\\_TOR\\_of\\_EIA\\_Letter\\_to\\_MEF\\_July\\_2010.pdf](http://www.sandrp.in/dams/Why_KALPSAR_project_should_not_be_cleared_for_TOR_of_EIA_Letter_to_MEF_July_2010.pdf)), this failed attempt seemed more like an effort to get some legitimacy for a half baked idea.

Unfortunately, Gujarat Govt or Modi are not going to be deterred by this failure. The ambitious politicians of India have for long been hankering for new temples where they can be worshiped by posterity. Nehru did realise his mistake of calling mega projects as modern temples in 1958 when he called such hankering as megalomania. But not too many people know this afterthought of Nehru. Nor do the ambitious politicians like Modi realise that prayers can be offered in a small place of worship as effectively.

Incidentally, one of the many possible things Kalpasar can mean includes Kalpanic Sarovar or imaginary reservoir. Will this one ever become real is a question that is not going to be answered in Modi's lifetime.

**Himanshu Thakkar** (An edited version published on [www.rediff.com](http://www.rediff.com))

**INDIAN EXPRESS CAMPAIGNS FOR BIG HYDRO IN NORTH EAST****Should a newspaper be allowed to twist facts for its misguided advocacy?**

Starting from Oct 8, 2010, one of India's leading National newspapers, *Indian Express* (IE) ran a campaign AGAINST Jairam Ramesh and FOR big hydro projects in Arunachal Pradesh. Here is a brief account about that campaign, including critical comments. The only other newspapers that carried some such stories and edits during the period were the *Jansatta* and *Financial Express*, both being Express group publications.

**Oct 8, 2010**

*Title: In note to PM, Jairam takes on Govt, puts question mark on N-E projects*

This opening salvo from Ravish Tiwari starts straight with direct attack: "In unprecedented distancing from the government by a key minister and questioning its development works in the strategic North-East (NE) and Bhutan, Environment Minister Jairam Ramesh...". These opening lines show that this is NOT a news story but a pandering of misguided & pro vested interest views. There was nothing unprecedented, nor distancing from the govt (what Ramesh was doing through the letter is exactly what a government functionary should be doing and his concern for environmental issues is exactly about his job as an environment minister), nor were these necessarily development works (past record of performance of such projects show this), but that does not bother IE.

Typically, then the story goes on to quote unnamed ministers, if at all these are quotes from the ministers, there is nothing in these quotes so that a minister would be ashamed or afraid to be named.

The story even speaks for the government, listen, "What's worrying for the government is that Ramesh has already made some assurances that could impact the pace of progress." This part of the story is not even a quote from some minister. So Indian Express equals the government? No doubt what is progress can only be defined by IE and no one else!

It is interesting that the IE reporter also has access to the minutes of the hydropower task force for NE that is denied under RTI (Right to Information Act) to SANDRP

(South Asia Network on Dams, Rivers & People), hear this: "It is recorded in the minutes of a recent meeting of the task force on hydro power development."

**These opening lines show that this is NOT a news story but a pandering of misguided & pro vested interest views. There was nothing unprecedented, nor distancing from the govt (what Ramesh was doing through the letter is exactly what a government functionary should be doing and his concern for environmental issues is exactly his job as an environment minister).**

**Oct 9, 2010**

*Title: Jairam got facts wrong on N-E projects: Engineers*

Next day, Mr Tiwari again quotes unnamed engineers, "But hydro-power project engineers associated with the Central Water Commission (CWC) of the Ministry of Water Resources expressed surprise, saying most of the 135 hydel

projects in Arunachal, with a few exceptions, are of small capacity. In fact, 77 are less than 100 MW capacity and unlikely to cause much downstream impact in terms of riverine ecology." There is no doubt that CWC and MWR (Ministry of Water Resources) are essentially lobbies for large dams and large hydropower projects. Mr Tiwari and the un-named engineers he is quoting are pretty ignorant or are acting pretty ignorant when suggesting that projects less than 100 MW are "unlikely to cause much downstream impact in terms of riverine ecology". The riverine ecology is a an organic whole from upstream to downstream and a large dam (and most of these projects involve huge dams) in fact any dam would

break that the organic link between upstream and downstream and thus have far reaching impact on the ecology, but Mr Tiwari and his unnamed sources do not seem to have anything to do with science of riverine ecology or hydrology.

His next para further illustrates his ignorance or

attempt in that direction, "These engineers pointed out that barring a few, all the projects there are run-of-river projects without the capacity to hold more than a day's waterflow upstream. Run-of-river projects store water during the day to release it during a specified period, called peaking hours, to generate power. The entire cycle is usually repeated every 24 hours, thereby not storing water to choke the flow downstream." Mr Tiwari also does not seem to know that Run of the river projects involve Long tunnels, upto 40 km long, and the water comes back to river only after coming out from such tunnels.

**Mr Tiwari and the un-named ministers and the engineers of the Central Water Commission he is quoting are pretty ignorant or are acting pretty ignorant when suggesting that projects less than 100 MW are "unlikely to cause much downstream impact in terms of riverine ecology".**

He makes another shocking misleading statement in next para, "The projects there will generate power close to the dam site, unlike many other run-of-river projects that divert water through tunnels to generation units several kilometres apart. In the latter case, reduction in waterflow can be felt before the water is again brought to the river several kilometres downstream from the dam. This is not the case with almost any of the projects in the North-East." He should have found out before making such completely false statements that (to illustrate), the length of the tunnel for Teesta 3 project is 13.52 km, for Teesta 4 it is 6.65 km, for Teesta 5 it is 17.106 km and for Teesta 6 it is 11.5 km, all in Sikkim, which incidentally is part of NE India and he was talking about projects in NE in the above line. But facts for IE have never been particularly sacred, thus violating one of the basic principles of journalism.

Nor is he bothered if the existing hydropower projects in India actually generate peaking power or not. For his kind information, there is no existing assessment to show how much of the current generation from hydropower projects is generated during peaking hours, such an assessment has never been done.

Mr Tiwari scales new heights in pandering new knowledge about rivers when he says, "The Lower Subansiri and Lower Demwe projects singled out by Ramesh are run-of-river projects. What has amused engineers is the talk of adverse downstream impact on Jorhat and Sibsagar because of the Lower Subansiri project — the towns are on the southern bank of the Brahmaputra while the project is on the north side." From NOW on, the north and south banks of rivers must behave differently, as desired by Indian Express.

May be, may be, in a report whose title screams that Jairam got his facts wrong should have got its own facts right?

Oct 9, 2010

EDIT: *Damming evidence*

IE does not believe in holding any punches, so it also put up this edit the same day. The edit starts with a shocking

**The *Indian Express* reporter should have found out before making such completely false statements that (to illustrate), the length of the tunnel for Teesta 3 project is 13.52 km, for Teesta 4 it is 6.65 km, for Teesta 5 it is 17.106 km and for Teesta 6 it is 11.5 km, all in Sikkim, which incidentally is part of NE India. But facts for *Indian Express* have never been particularly sacred, thus violating one of the basic principles of journalism.**

statement: "If there is one focus for the growing concern that UPA-II is characterised by policy incoherence, it could be the Union environment ministry." This is shocking because the job of the environment ministry is supposed to work towards protecting the environment with as much or greater vigour than what the mining or power ministry does for mining or power projects. But we all are so used to an environment ministry that also acts as a rubber stamp or worse as an agent for environment destruction, that the current environment ministry that is taking their job slightly seriously, is not liked by the right wing national news paper and is ready to blow punches at its own credibility by writing such edits.

The edit ends with a certificate that has absolutely no merit: "Policy on the development of the Northeast was formulated with care, by an inter-ministerial group". Pray, sir, please explain what care and democracy was involved in formulating these big dam plans for NE? What was the involvement of people of NE? But IE has no time for such niceties, it seems.

Oct 13, 2010

Title: *Arunachal delegation seeks Krishna's help*

**Nor is he bothered if the existing hydropower projects in India actually generate peaking power or not. For his kind information, there is no existing assessment to show how much of the current generation from hydropower projects is generated during peaking hours, such an assessment has never been done.**

To keep the fire on, the paper repeats the quotes from an earlier report, this time, with the "news" that a Member of Parliament and two Members of Legislative Assemblies also met the External Affairs Minister. They have not yet bothered to report what the people of Assam, Sikkim, Manipur, Meghalaya or even Arunachal Pradesh feel

about the projects, what the Assam Legislative committee has said, what the expert committee has said about Subansiri project and so on. This is worse than biased reporting.

Oct 14, 2010

Title: *Arunachal CM rebuts Jairam, sends SOS to PM: national interest at stake*

New ammunition is now available in the form of letter of Arunachal Pradesh CM to PM on this issue. Considering the nature of the events, it is a bit surprising that IE got

this letter dated Oct 11 only on Oct 13, one assumes, since it is reported on Oct 14. It is though not a surprise that only IE got this letter, as also earlier Jairam Ramesh letter to PM! We are not saying that the PMO (Prime Minister's Office) is using the IE to beat up their own Environment Minister.

The letter from Arunachal Pradesh CM, the report claims, "Khandu has rebutted all of Jairam's arguments regarding basin studies, downstream impact assessment study and dam safety, and highlighted benefits to the downstream area, particularly to Assam."

We have reviewed that letter and this is completely unfounded claim, but facts have never been a hindrance for some IE reporters, it seems. For example, the Arunachal Pradesh CM claims, "It was observed that as in case of Ranganadi HEP (Hydro Electric Project) (405 MW) the projects provide positive benefit to downstream areas."

But the fact of the matter is that people of Assam have been feeling that the dam has accentuated flood disasters in Assam and even Assam CM (Chief Minister) have written to the Prime Minister about this. But more important is the claim about POSITIVE benefits to downstream areas, for which neither the Arunachal CM, nor the IE provides any support. One wished reporters of national newspapers were slightly more discerning in reporting such false claims as facts.

Oct 20 2010

**Title: Arunchal CM statement: Hydro projects won't affect downstream areas: Khandu to Jairam** This one is by Amitabh Sinha

In terms of pandering unfounded statements as if they were facts, this report takes the cake, or rather the whole bakery: "Khandu informed Jairam that concerns of Assam on the downstream impacts of hydropower projects in Arunachal were highly exaggerated since only two of the projects in his state actually involved construction of dams. The rest were run-of-the-river projects which offered no threat to people downstream." It seems the reporter Mr Sinha has no idea what a dam is and that everyone of the 100+ big hydro of Arunachal involves LARGE DAMS as defined by India's Central Water Commission, International Commission on Large Dams and also the World Commission on Dams. This includes all the run of the river large hydropower projects of the Arunachal Pradesh and each one of them will

**The *Indian Express* reporter scales new heights in creating new knowledge about rivers when he says, "... the towns are on the southern bank of the Brahmaputra while the projects are on the north side." From NOW on, the north and south banks of rivers must behave differently, as desired by the *Indian Express*.**

have very very significant and far reaching social and environmental impacts both in the upstream and downstream of the project sites.

Oct 21, 2010

**EDIT: All cleared up?**

Ok, now we have competition for the award of bakery. The second edit in two weeks in this national newspaper that is increasingly reading more like a lobby for large dams says, "The answers should worry us. For one, the problem is that the environment ministry has been

careless and unwise in its approach to the various relatively small projects that have been planned for Arunachal in an attempt to increase the region's prosperity and integration into the rest of the economy.. it's a question of India's political will..." So the newspaper decides to call the projects that involve huge dams, long tunnels,

submerging forests, destroying hills, creating millions of cubic meters of muck and drying up rivers and displacing people and also creating massive methane emissions in some cases, as "relatively small projects". Nehru once called such thinking as megalomaniac, but Shekhar Gupta and company won't mind that I guess. There are many other misleading and Orwellian assumptions in this edit, but let us not detail them here. Mr Gupta, in true Orwellian manner, does not forget to say that these projects are also important for "human reasons".

Oct 22, 2010

**Title: On the backfoot, Ramesh writes to PM again: I am batting for strategic projects**

This is a back thumping report, using selective quotes from another letter Mr Ramesh is supposed to have written to PM. We of course do not have benefit of reading either this or his earlier letter that IE opened this series on Oct 8, 2010 nor would the IE make them public. IE had done similar campaign against Ramesh in Feb 2010 on the issue of GM crops. Then they did not get the back thumping

**Nehru once called such thinking as megalomaniac, but Shekhar Gupta and company won't possibly mind that. The edit, in true Orwellian manner, does not forget to say that these projects are also important for "human reasons".**

opportunity, they claim they have got it this time, we hope that is not the case. Incidentally, it was wrong on the part of Mr Ramesh to expedite clearance for Lower Siang project, as quoted here, since that is not an environment minister's job. In fact that would go against the job of an environment minister.

**Himanshu Thakkar** (An Edited version of this story has been published on: <http://www.thehoot.org>)

## PILs lead to the framing of Policy on Sand Mining for Maharashtra

According to Maharashtra Chamber of Housing industry, Maharashtra consumes over 65.55 million tonnes of sand a year, with a growth rate of 7%. All of this is river or creek sand, acquired by mechanically or manual dredging banks of rivers or creeks. Though the use of crushed sand (obtained by crushing rocks, usually mined from hills) is allowed by the govt, construction industry claims that many govt offices do not allow them to use this for big infrastructure projects like roads and bridges. As the construction industry and urbanisation boomed, the demand for river sand also sky rocketed. With 40% urban population, Maharashtra is the most urbanised state and the builders lobby here is very strong, with direct ties with govt officials & politicians. Though sand mining has been wreaking havoc with river ecology, very little was done to regulate it.

However, through some welcome developments initiated by PILs filed by NGOs and local communities over the last two years, the picture seems to have changed. Under pressure from local protests and High Court, Maharashtra has now framed a policy for sand mining.

**Basic problems** Current Sand mining practises involve dredging the river bank with dredgers. Manual sand mining, which has limited impacts on the environment is being jeopardised by the mechanised dredging. The dredgers are mostly owned by the wealthy and corrupt sand mafia. This has resulted in huge sand abstraction and has destroyed the aquifers in sand. These sand aquifers, though limited in stretch, are an important local source of water, especially in the summer. Sand Mining is specifically damaging in rivers with influent aquifers, i.e. basins in which water from the river recharges the aquifers. Here mining and dredging results in flow of the stored water downstream, at a high velocity. Also for rivers with effluent aquifers (where the groundwater aquifers feed the river), the sand beds retain a considerable amount of water which is either evaporates or flows downstream after mining, affecting the water availability of a specific region.

Dr Shrikant Limaye, Groundwater Institute, Pune says: "consider a stretch of riverbed sand of 1000 m length, 20 m width & 3 m depth, making to 60,000 cubic m volume, which is fully saturated with water in summer season, when the river flow has stopped. With 15% specific yield, the quantity of water available from this sand would be enough to supply a village with a population of about 900, water for 100 days at 100 lit/ person/ day."

**Public Interest Litigations and responses** In 2009, Sand mining was banned in the CRZ zones, following a petition made by Awaaz Foundation, Mumbai-based NGO. Though sand mining stopped at the previous hot spots, illegal mining and dredging along creeks and river banks, especially surrounding Mumbai, increased.

On 23 Sept 2010, Bombay High Court banned Sand Mining in entire Maharashtra following a petition filed by

*Sagar Shramik Haat Pati Vaalu Utpadak Sahakari Sanstha*, a union of manual sand excavators. The court asked the govt to formulate a policy in four weeks.

On 20 Oct 2010, State cabinet approved a new sand mining policy. The main features of the policy are:

- It is compulsory for contractors to obtain permission from the Gramsabha, for sand mining. The final decision-making powers rest with sub-divisional officer.
- The policy bans use of suction pumps in dredging
- It provides for a 2% environment cess on earnings from mining.
- The Revenue Dept should give sand mining licences only through a bidding process. Even where many small fishermen extract sand manually, bids have to be submitted by local fishermen's organisations. (Based on media reports, the Policy has not been updated as yet on the official website of Government of Maharashtra.)

On 25 Oct, 2010, in view of the new policy, the Bombay High Court division bench of Justice BH Marlapalle & UD Salvi revoked the ban on sand mining. The court, while

Dr Shyam Asolekar, Head of Dept of Environmental Science & Engineering at IIT Bombay, was appointed by the High Court to present a report on the status and alternative technologies for dredging. He has told the state that an audit needs to be done to check the "present status of destruction of habitats of fishermen and fishes due to prevailing rampant sand dredging and mining". He has stated that there is an urgent need of conducting environmental audit of rivers, estuaries and their ecosystems, studying the biodiversity and dependence of fishermen and coastal communities on the water bodies, looking into the destruction caused by dredging and mining and taking stock of the resources of the sand mining sector. He says that it is the need of the hour to minimise construction industries footprint on these zones. Asolekar has called for "recovery & recycling of construction quality sand from debris".

lifting the stay, noted, "The state has to find an alternative for sand being used in construction or else this fast depleting natural resource will not be available a decade." The bench has restricted the excavation up to 2 m in nullahs, creeks & rivers, and has said that offences in this regard should be made non-bailable.

However, the policy has failed to address key concerns:

- Mechanical dredging, which has damaged the environment has been allowed, pushing manual excavators to the brink of starvation and ruining fishing.
- The policy has neglected the plight of manual miners by retaining sand auctioning, which involves large sums of money. By giving the final authority to SDO, a revenue officer, the policy denies the local community a share in decisions which are vital to its well being.
- The policy has disregarded the Coastal Regulation Zone 2001, which prohibits dredging along coasts. (Down to Earth 301110, Indian Express 271110, DNA 011010)

[parineeta.dandekar@gmail.com](mailto:parineeta.dandekar@gmail.com)

## CLIMATE CHANGE & WATER SECTOR

**India's first 4X4 climate assessment report** On Nov 16, 2010, India's Union Minister of State for Environment and Forests (Independent Charge) Jairam Ramesh released country's first 4X4 climate assessment report. It is called 4X4 since it covers four climate vulnerable regions and looks at four key sectors. As Ramesh said in its foreword to the report, "This report provides an assessment of impact of climate change in 2030s on four key sectors of the Indian economy, namely Agriculture, Water, Natural Ecosystems & Biodiversity and Health in four climate sensitive regions of India, namely the Himalayan region, the Western Ghats, the Coastal Area and the North-East Region. It is for the first time that such a comprehensive, long term assessment has been undertaken based on rigorous scientific analysis. It is also for the first time that an assessment has been made for the 2030s (all previous assessments were for the 2070s and beyond)." The report takes 1970 as the base year, a departure from most other reports that consider pre industrial revolution or 1990 as the base year.

Using a Hadley Centre Regional Climate Model version 3 (HAD RM 3); the report has been put together by Indian Network for Climate Change Assessment, which was launched by the Union Ministry for Environment and Forests on Oct 14, 2009. Ramesh said about the network, "INCCA is a network-based programme that brings together over 120 institutions and over 220 scientists from across the country to undertake scientific assessments of different aspects of climate change assessment."

**The Himalayan region** While describing this region in section 2.3.1, the report makes a strange statement, "The Himalayas have major hydroelectric potential, but the development of hydroelectric resources requires outside capital investment." This is indeed very strange because the report does not even take note of the likely impact of such projects on the parameters it is studying, nor does it take note of the kind of impacts such projects would have on the climate itself. The hydropower projects in the Himalayan region are aiding the climate change impacts and more such projects will accelerate the climate change impacts. The issue of need or otherwise of the outside capital investment is any case beyond the mandate of the report.

### Key findings of the study

**Overall Projections** All of the four regions examined indicate an overall warming of 1.7-2.2 degrees Celsius, including extreme high and low temperatures by 2030.

The Western Ghats, a hill-region running parallel to the west coast in peninsular India and traversing six states, will be impacted greatly by a rise in temperature by as much as 4.5 degrees Centigrade. It is recognized as a global biodiversity hotspot.

**Intense Precipitation** Rainfall & snowfall are projected to increase and intensify in India, adding 5-10 annual days of extreme events in all four regions by 2030. The country will have 3-7 per cent overall increase in summer monsoon fall in the 2030s with respect to 1970s. On a seasonal scale though, except for the Himalayan region, all other regions are likely to record lower rainfall in winter as well as pre-summer period.

Extreme rainfall events have shown an increase since the 1980s across the country. The study covered precipitation analysis of 165 stations across the four regions and found that many places had shown an increase of 40-370 per cent increase in intensity since the 1980s. For example, Amini Devi in Lakshadweep islands recorded 170 cm of rain on a single day on May 6, 2004, as opposed to the previous one-day extreme rainfall event that had recorded only 25 cm. In parts of Western Ghats and north-eastern India, one-day rainfall of 50 cm and above has been recorded. The study noted that the intensity of rainfall has been rising in the period 1980-2010 and the pattern will intensify by the 2030s.

**Sea Level Rise** Sea level in India has been increasing by 1.3 mm/year, which is consistent with IPCC projections and is anticipated to continue to rise; cyclones will intensify, while the number of cyclones decline. Sea-level rise will impact several areas on the country's east coast. Three most vulnerable coastal areas studied for inundation due to sea-level rise were Paradip, Nagapatinam and Kochi. The study showed if the sea-level rises by one metre, it will inundate up to 478 square km coastal area around Paradip, 169 sq km around Kochi and 4.2 square km surrounding Nagapatinam which is known for storm surges and tsunami in 2004.

**Floods & Droughts** All four regions are expected to experience a 10-30 percent increase in the magnitude of flooding from the existing levels; droughts are expected in most of the regions with the Himalayan region experiencing moderate to extreme drought severity.

**Crop Production** Rice, corn, and sorghum yields will fluctuate in India. While a few areas are projected to see a modest (4 percent) increase in rice yields, others will see sharp declines (as high as 50 percent) in rice, corn, and sorghum yields.

The warmer atmosphere will be good for irrigated rice, as it tends to increase with carbon dioxide fertilisation, says the report. However, rainfed agriculture, which provides livelihood for the majority of India's farmers, will suffer, and there will be more stress on livestock and on milk productivity.

Pratim Roy, director of the Keystone Foundation, which works with tribal communities, biodiversity and livelihood in the Western Ghats, notes the report's findings on rainfall and rainfed agriculture. "We apprehend an

accentuated erraticity in the Western Ghats' plantation (tea) sector, in small agriculture and also high flooding". "For instance", says Roy, "this year there was very poor productivity in any seasonable crop, be it in agriculture, beekeeping or others, because flowering and the rains have both come together, instead of in its usual periodicity. So an entire food basket collapsed this year. The report underlines a very high impact in highland areas".

**Livestock** Cattle, pigs, goats and other livestock are all predicted to be highly vulnerable and stressed, including reduced milk production, as a result of increased temperatures, especially in the months of May and June.

**Fisheries** - Sardine and mackerel populations are likely to shift populations northward and some populations may increase overall yield.

"The west coast might have more mackerel, the eastern coastline faces severe marine pollution," says Arjilli Dasu, executive secretary of the Vishakhapatnam-based District Fishermen's Youth Welfare Association. "The eastern coast has no ecological conservation measures, such as mangrove regeneration, in place. We expect, at the current conditions, that the sea will ingress at least 10 to 15 metres into the villages by 2020 itself."

**Forests/Biodiversity** All four regions are vulnerable to climate change in the short term, with changes ranging from 8-56 percent in vegetation cover.

**Human Health** Malaria and other vector-borne diseases are projected to spread to northern regions while the malaria transmission window may decline in coastal areas.

The study has recommended that state-specific action plans on climate change for short, medium and long-terms should be made. (Report on the MEF website: [www.moef.nic.in](http://www.moef.nic.in), Deccan Herald 271110, IPS 291110)

**Global Temp Could go Up 4° C By 2060** World temperatures could soar by 4° C by the 2060s in the worst case of global climate change and require an annual investment of \$270 billion just to contain rising sea levels, studies suggest. Such a rapid rise, within the lifetimes of many young people today, is double the 2° C ceiling set by 140 governments at a U.N. climate summit in Copenhagen last year and would disrupt food and water supplies in many parts of the globe.

Rising greenhouse gas emissions this decade meant the 2° degree goal was "extremely difficult, arguably impossible, raising the likelihood of global temperature rises of 3-4° C within this century," an international team wrote. The studies, published to coincide with annual U.N. climate talks in Mexico starting, said few researchers had examined in detail the possible impact of a 4° C rise above pre-industrial levels.

One of the papers gave what it called a "pragmatic estimate" that sea levels might rise by between 0.5 and 2 m by 2100 if temperatures rose by 4° C. Containing a sea level rise of 2 meters, mostly building Dutch-style sea walls, would require annual investments of up to \$270 billion a year by 2100. That sum might limit migration to perhaps 305,000 people from the most vulnerable areas, wrote Robert Nicholls of the University of Southampton. Lack of protective measures could mean the forced resettlement of 187 million people. People living on small islands, in Asia, Africa or river deltas were most at risk. The studies concluded that governments should do more both to cut greenhouse gas emissions. (Reuters 301110) Considering the state of governance on climate change, the 4° rise by 2060 is the most likely scenario and not the worst case scenario as this Reuters piece suggests.

**Bangladesh, India most vulnerable** Of the 16 countries listed as being at "extreme" risk from climate change over the next 30 years, five are from South Asia, with Bangladesh and India in first and second places, Nepal in 4<sup>th</sup>, Afghanistan in 8<sup>th</sup> and Pakistan at 16<sup>th</sup>. South Asia is the world's most climate-vulnerable region, its fast-growing populations badly exposed to flood, drought, storms and sea-level rise, according to a survey of 170 nations published on Oct 20, 2010. The Climate Change Vulnerability Index, compiled by a British-based global risks advisory firm, Maplecroft, is intended as a guide for strategic investment and policy making.

The barometer is based on 42 social, economic and environmental factors, including the responsiveness of government, to assess the risk to population, ecosystems and business from climate change. South Asia is especially vulnerable because of changes in weather patterns that result in natural disasters, including floods in Pakistan and Bangladesh this year that affected more than 20 million people.

"There is growing evidence climate change is increasing the intensity and frequency of climatic events," the firm's environmental analyst, Anna Moss, said. "Very minor changes to temperature can have major impacts on the human environment, including changes to water availability and crop productivity, the loss of land due to sea-level rise, and the spread of disease."

Bangladesh is rated No.1 because of a double whammy. It has the highest risk of drought and the highest risk of famine. It is also struggling with extreme poverty, high dependence on agriculture - the economic sector most affected by climate change - and a government that is the least capable of coping with climate impacts. A two meters rise in the level of water in the Bay of Bengal, as reports drafted under the United Nations system have warned, could result in reduction of Bangladesh's land mass by as much as a quarter, necessitating the evacuation of 25 to 30 million people.

As for India, "almost the whole (of the country) has a high or extreme degree of sensitivity to climate change, due to acute population pressure and a consequential strain on natural resources," Maplecroft said. "This is compounded by a high degree of poverty, poor general health and the agricultural dependency of much of the populace."

China (49<sup>th</sup>), Brazil (81<sup>st</sup>) and Japan (86<sup>th</sup>) were among countries in the "high risk" category. The "medium risk" category included Russia (117<sup>th</sup>), the United States (129<sup>th</sup>), Germany (131<sup>st</sup>), France (133<sup>rd</sup>) & Britain (138<sup>th</sup>). Norway led the group of 11 nations considered at least risk, which is dominated by fellow Scandinavians as well as the Netherlands, which has worked hard to defend its low-lying land from rising seas. The new index uses three "sub-indices" that focus especially on a country's ability to respond to climate change stress.

"The most serious vulnerabilities to climate change are found in a group of developing countries with socio-economic systems ill-equipped to address development challenges such as food and water security, in addition to being burdened by unstable economies and weak institutions," Place said. (The Himalayan times 201010, [www.petercusters.nl](http://www.petercusters.nl))

**DAMS**

**Protests against Kalu dam near Mumbai**



Protests by tribal farmers of 18 villages to be affected by the proposed Kalu dam for water supply for Mumbai

lead to stoppage of work at the dam on Sept 21, 2010. The dam site is located near Murbad, about 90 km north of Mumbai. The dam over the river Kalu will be constructed between Murbad and Shahpur talukas in Thane district at a cost of Rs 1,373 crore to supply 900 million liters per day. Far western suburbs of Mumbai such as Bhayander, Vasai and some part of Mumbai's west are expected to get half the share from the Kalu dam's total supply. The developers want to complete the dam by 2014. Subhash Gharat, who is leading the agitation, said that the local farmers did not accept rehabilitation package. "The government is offering us just Rs 40,000-50,000 per hectare."

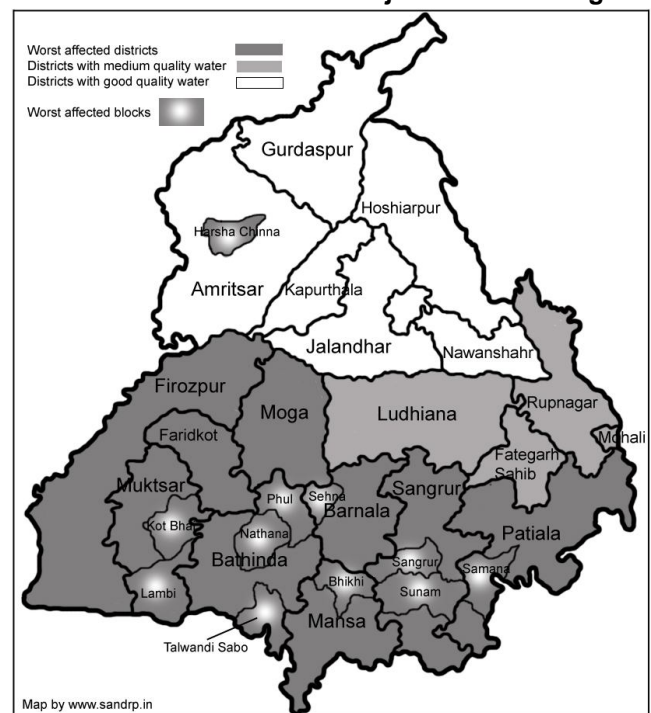
The dam will displace 15,000 residents, most of which belong to local tribes. "We are not skilled people. Our principal occupation is paddy farming," Gharat said. Legislator Sanjay Kelkar said that the government had not taken permission from the Union Environment and

Forest Ministry. Thane Collector AL Jarhad said the local tehsildar had stopped construction of site office because of the prevailing law and order situation. MMRDA joint project director Dilip Kavathkar said the city's water share from Kalu dam had not been decided yet.

A fortnight later local farmers also rejected the state's offer of a rehabilitation package. "We don't want the dam here, so there is no need for rehabilitation," said Subhash Gharat. Revenue, relief and rehabilitation minister Narayan Rane had directed officials from the revenue department and Mumbai Metropolitan Region Development Authority to conceive packages as per demands of the locals. The dam is a joint project between the MMRDA and the Konkan Irrigation Development Corporation. (The Hindustan Times 240910, 131010)

**GROUNDWATER**

**42% of Groundwater in Punjab unfit for irrigation**



Nearly 42% of the groundwater in Punjab being used for irrigation has saline and sodic elements, and the Malwa belt is the worst off with nearly 60% of its area affected. Continuous use of such water leads to reduced productivity of the soil, and thus lower yields. The Lambi constituency, represented by chief minister Parkash Singh Badal, also figures among the three blocks worst affected by salinity, Kot Bhai and Talwandi Sabo being the other two, where more than 60% of the area has saline water.

Bathinda district has the least area (9.7%) under "good quality" water for irrigation. Across the state, the nine "worst affected" blocks are Nathana, Phul, Bhagta Bhai Ka, Sehna, Bhikhi, Sunam, Sangrur, Samana and



Harsha Chinna. These are the findings of the survey on "Ground Water Quality for Irrigation in Punjab", conducted jointly by the Punjab Remote Sensing Centre (PRSC), National Bureau of Soil Survey and Land Use Planning and the groundwater cell of the Punjab Agriculture Department.

The figures should set alarm bells ringing, as nearly 70.7% of Punjab's farm land depends on groundwater. The majority of land is, thus, threatened with losing productivity. This is the first ever thorough study of irrigation water – most surveys thus far have focused only on drinking water. The survey was conducted over nearly eight years, taking samples from around 6,000 tube wells covering every block of Punjab.

Dr PK Sharma, director of the PRSC, said: "Good quality water covers 51.3% area, marginal 36.5% and poor quality 6.3%. Samples from 5.9% of the area were not taken, it being not available for agriculture." The study has categorised 36.5% area of the state as moderate to highly affected – with 9.6% bearing saline water and 25.4% sodic (concentration of Sodium higher than Calcium-Magnesium). Area with "poor quality water" – unsuitable for irrigation – stands at 6.3%. (The Hindustan Times 231110)

## HYDRO PROJECTS

**Past misdeeds haunt Kol Dam** The Union Ministry for Environment and Forests has said it is against the diversion of 124.054 hectares of forest land from the Majathal Wildlife Sanctuary in Solan district for the 800-MW Kol Dam project on the Sutlej in Bilaspur district. The project is under construction for long and the project authorities had under reported the area of forest land, including sanctuary area while getting clearance for the project and also in its Environment Impact Assessment. The National Thermal Power Corp is developing the project, whose foundation stone was laid June 5, 2000, by then prime minister Atal Behari Vajpayee. NTPC spokesman Vishwanath Chandan told IANS: 'We have received the objections raised by the environment and forest ministry's high-powered committee. We are in the process of filing a reply.'

The committee took a serious view of the submersion of more than 50,000 trees due to the construction of a reservoir and the threat to the sanctuary's flora and fauna. 'The committee has refused to accept the NTPC proposal in the present form and asked it to come out with a modified proposal,' said an NTPC official. (IANS 041110)

## WATER POLLUTION

**Pollution Control Board is a failed institution** Sant Balbir Singh Seechewal, a noted environmentalist from Punjab has said, "Divine verses of Guru Nanak Devji uttered about 500 years ago made me an activist on environment. Guru Nanak Devji has called air the Guru,

water the father and earth the mother." On Punjab's environment he said, "Punjab is one of the highly polluted areas in the world. Its rivers are filled with filth, toxic chemicals and metals. At one stage water used to be worshiped in the state. It was known as amrit. But now it has virtually become poison in some parts of the state. Some people drinking this water have fallen ill." On his experience as a member of the Punjab Pollution Control Board Seechewal said, "...had I not become the PPCB member, I would have not been able to understand the hollowness of such institutions. (My experience is) Sour because the PPCB seems unable to play the role of a guardian to the environment. It is just another institution pushing papers and files from one place to the other and doing little to address the people's concerns regarding the pollution of rivers, air, subsoil water, etc." (The Tribune 281110)

## RIVERS

**Floodplain encroachment kills people in Delhi** At least 70 people were killed in Delhi in November 2010 when a building in floodplain collapsed due to prolonged water logging of its basement, in addition to unsafe floor additions. The Delhi Municipal agencies, including the Municipal Corporation of Delhi, the Delhi Government Flood Department, Groundwater department, Delhi Jal Board, the state and Union Environment Ministries failed to see the danger and continued encroachment of flood plains could invite more such disasters. As pointed out by the numerous letters from Yamuna Jiye Abhiyaan to the concerned authorities, they must share the blame. However, in stead learning lessons from such disasters, there is further encroachment of the Yamuna floodplain in Delhi. Thus Delhi Transport Corporation that was allowed to construct a depot in the Yamuna flood plain before the Common Wealth Games on the promise of it being a temporary construction to be vacated after the games, the DTC, backed by the Delhi Chief Secretary, are now saying that they wont vacate the floodplain land. This is likely to further erode the credibility of the words of the Delhi Government. Now the Delhi Urban Art Commission has declared the DTC structure illegal.

Pointing to an abnormal rise in the pressure of sub-soil water in East Delhi, the Delhi Jal Board has acknowledged that this has had an adverse effect not only on its sewer lines but also buildings and roads in the area. The Jal Board's admission comes days after a building collapsed in Lalita Park, killing 70 people.

"An abnormal rise in groundwater level and its pressure during the monsoon this year have adversely affected our sewerage system, hitting important joints in our lines and resulting in their collapse. This in turn is affecting roads and buildings," said Ramesh Negi, Chief Executive Officer of Delhi Jal Board. "In the long term, we need to strengthen our system in the entire floodplain," said Negi.

Before the monsoon, sub-soil water in the area was 8-9 metres deep. Post-monsoon, the area has seen a sharp rise in the level of sub-soil water. "Now, basements in the area, which are only 2-3 metres deep, are flooded with this sub-soil water. These structures have not been designed for a condition like this. We can say there can be a repeat of such an incident if building structures in such areas are not rectified," said V P S Tomar, Chief Engineer of the Flood Department. (Indian Express 291110)

## WETLANDS

**MEF Conservation Scheme** Wetlands and Mangrove forests support aquatic biodiversity and provide various eco-system services for benefit of humankind. These important hotspots of biodiversity and ecological importance are shrinking in size due to anthropogenic pressures, uncontrolled siltation, weed infestation, discharge of domestic sewage/ industrial effluents, surface run-off, etc. Ministry of Environment and Forests has identified 115 Wetlands covering 26 States/UTs and 38 Mangrove forests covering 10 States/UTs under the Scheme on Conservation of Wetlands and Mangroves. Under this 100% assistance is given to the concerned state govts for various activities including afforestation, catchment area treatment, water management, protection measures, fisheries development, weed control, wildlife conservation, pollution abatement, eco-development activities. The Ministry has just notified the rules for conservation of wetlands. (PIB 291110)

## AGRICULTURE

**Farmers destroy DuPont's GM rice** About 100 farmers in Karnataka destroyed a paddy field where multinational seed major DuPont was conducting field trials for genetically modified (GM) rice in collaboration with University of Agricultural Sciences Bangalore. The trial was on about a hectare field at Krishi Vigyan Kendra in Doddballapur, 40 km from Bengaluru. In September the Genetic Engineering Approval Committee, the nodal agency for clearing GM crops in India, gave its permission to conduct the trials. The farmers alleged they were not informed. The officials did not seek the necessary permission from the local panchayat body before conducting the trials, said a panchayat member. Only a few farmers whose land adjoins the Krishi Vigyan Kendra were warned not to plant paddy this year, he said. "No one gave them any reason or explanation for this," he added.

Farmers' movement group Karnataka Rajya Raitha Sangha alleged the officials did not mark the area as GM field, which is mandatory while conducting field trials for GM crops. The farmers came to know about it when A Venkatesh, a volunteer of campaign group GM-Free Karnataka, visited the Krishi Vigyan Kendra campus. The farmers stormed the field in the early hours on November 17. They slashed and burned 75 per cent of the crop. Since the trials were going on in the open air, it

could have contaminated rice varieties in nearby areas, said Venkata Reddy, vice president of KRSS. Following the incident several farmers groups in the state have demanded that Karnataka be declared a GM-free state. (Down to Earth 151210)

**Share of Organic Fertilisers** In total fertilizer market, while the share of chemical nutrients is 25 million tonnes, bio-fertilizer and organic manure/ fertilizers contribute 0.15 million and 5.23 million tonnes respectively. (PIB 301110)

## WATER SECTOR

**Serious Hazards of Shale gas exploration policy** India is formulating a policy framework for shale gas exploration in the country and hopes to have its first auction of shale gas fields by mid 2011. Indian companies (mainly Reliance, but also ONGC) have been buying shale gas technology and assets aggressively abroad.

The Ministry of Petroleum and Natural Gas along with the Directorate General of Hydrocarbons is drafting a policy for exploiting the shale gas reserves in the country and has constituted a Multi-Organization Team for this.

Serious concerns have been reported about the impact of hydraulic fracturing (or 'fracking'), the technique used to extract shale gas, on ground water resources. These concerns must be addressed thoroughly before drawing up a shale gas exploration and extraction policy. Some of the major concerns are listed below.

**Water security** Fracking is a very water intensive process that requires close to 20 million litres of fresh water per fracking, with each well likely to be fracked between 1 and 6 times during its lifetime of 30 years. This translates to a water requirement of 2 trillion cu m every few years even if one conservatively assumes that only 100,000 wells would be dug in the country.

It is very likely that these gas wells will primarily be in rural areas. This may lead to significant water related conflicts since over 60% of India's irrigated agriculture still depends on ground water and about 90% of rural water supply depends on ground water. The Central Ground Water Board's assessment states that 35% of the country's population is already dependent on ground water sources that are semi-critical, critical or over-exploited, and this percentage has rapidly increased over the last decade or so. Therefore, during the fracking periods, there could be severe conflicts among different competing uses of water. These conflicts are likely to be particularly intense if the wells were to come up in states such as Rajasthan, Punjab, Haryana, Tamil Nadu, Gujarat, Andhra Pradesh, Madhya Pradesh, Chhattisgarh and Karnataka where ground water in over 50% of blocks are semi-critical, critical or over-exploited. It has been reported that the Cambay basin and Krishna Godavari basin are likely to be potentially rich in shale

gas. However, groundwater situation in both these regions is also alarming and setting up shale gas wells in these regions should only be done after a careful analysis of water availability for different competing needs and only with consent of the gram sabhas and also after ensuring that the water for drinking and irrigation needs is not affected.

**Ground water pollution** The possibility of ground water pollution due to fracking is another major concern. The question is currently being extensively debated in the U.S. and there is a possibility that the exemption awarded to fracking from the Safe Drinking Water Act will be repealed. Further, the Pittsburgh city council unanimously decided to ban all gas drilling within its city limits on 16<sup>th</sup> November 2010 and the U.S. EPA has constituted a study to fully understand the impacts of fracking for shale gas on ground water. Some of the chemicals used in the fracking process (such as benzene, Aldecide G and deodorized kerosene) are known to be very harmful to humans and other animals, and there have been worries of these chemicals leaching into the underground aquifers and contaminating the groundwater supply. Remediation of groundwater from such pollutants is highly challenging, time-consuming and expensive. Given the weak and fragmented regulatory regime currently overseeing issues of water pollution in India, fracking could pose a serious threat to water quality for irrigation and drinking water, and severely endanger public health.

In addition to the threats of pollution from chemicals mixed with water during fracking, there are also fears of contamination from the material coating the drill-bits and from the possibility of the escaping gas mixing with ground water. Thus, there are significant worries regarding pollution of ground water sources due to the fracking process.

**Treatment of 'produced water'** The mixture of water and chemicals that remains after the fracking process is called 'produced water'. Since produced water naturally contains many of the toxic chemicals used in fracking, its treatment, disposal and storage is also an important issue that needs attention. If produced water is not stored or disposed properly, it is likely to introduce toxic chemicals into not only ground water sources but also streams, rivers and the soil.

**Recommendations** In light of these concerns regarding shale gas extraction process, the *precautionary principle* needs to be adopted while drafting a policy on shale gas extraction.

1. Drilling for shale gas in any area should be permitted only after performing an environmental and social impact assessment and making sure other conflicting needs of water are not compromised over the well's lifetime. The assessment and other reports must be subject to public scrutiny and the final decision must be taken only after

consent from affected gram sabhas and a public hearing with all the potentially impacted citizens.

2. Permissions should be issued subject to an undertaking from the exploration agency that scientific 'groundwater recharge' programs or financing such programs over a suitably large area would be taken up, to compensate for groundwater abstraction for fracking.

3. Each round of fracking should be undertaken only after consent from gram sabhas, consultation and due consideration is given to water availability for other competing needs, to ensure that fracking only takes place in seasons when there is no scarcity of water.

4. A study on the lines of the U.S. EPA study, which could be led by the Central Ground Water Resource Board and the Geological Survey of India and involving credible independent persons, should be constituted to understand the relationship between fracking and groundwater resources. Fracking should not be allowed until the study is completed, discussed in public consultations and accepted by the Government.

5. Complete details of all chemicals used in the fracking process of each well, including their CAS numbers and their impact on human, plant and animal health, must be disclosed by the drilling company and made publicly available at a centralized location.

6. The safety of each shale gas well must be certified by a suitably empowered and capable agency. Such a certificate should certify that the fracking process will not result in groundwater or soil contamination and that the gas in the wells will not escape into the groundwater and mix with it. The certification and testing process itself must be transparent, in public domain and verifiable by third party experts.

7. In case of any dispute regarding water (or soil) contamination due to any phase of the shale gas extraction process, there must be an unambiguous and transparent dispute redressal mechanism. Moreover, in such cases, following the precautionary principle, the onus of proof that the fracking process does not contaminate water must lie with the exploration company.

8. Since shale gas exploration has a close relationship to water exploitation, the MOT deciding shale gas related policies must contain a representative from Ministry of Water Resources and a representative of the Central Ground Water Board in addition to a member from the Ministry of Environment and Forests.

9. After due study as mentioned above, if the Parliament agrees to take this up, it should be taken up only on experimental level with one well at one location, observed for minimum three years to see the performance and the experience.

Implementing such recommendations may require strengthening and streamlining institutions such as the various agencies dealing with water issues across different states and the pollution control boards at state and central level, so that they can regulate the abstraction and use of groundwater.

Shale gas exploration cannot be at the cost of either water security or public health. Therefore, we urge the govt to consider these recommendations in earnest and adopt them in public interest.

EAS Sarma, former Power Secretary adds: In this connection, I wish to point out that "hydraulic fracturing" is used in many natural gas development projects to enhance the recovery of the gas. This is known to cause pollution of ground water aquifers. In addition, gas development is also known to cause "land subsidence" due to pressure losses, depending on the strength of the overlying rock formations. In the case of Krishna Godavari basin where gas is being extracted, it is feared that such land subsidence has already started occurring. It could lead to loss of vast stretches of agricultural land and incursion of salinity in ground water aquifers. Prof. G. Krishna Rao of Visakhapatnam and some farmers' organisations of KG basin have, in fact, filed a case before Hon'ble AP High Court. The court ordered MOEF to carry out a fresh environmental appraisal of the project by constituting an expert group. The group has already submitted its report. The report indicates the possibility of subsidence in the basin.

For more Information see: <http://www.scientificamerican.com/article.cfm?id=shale-gas-concerns>; <http://www.scientificamerican.com/article.cfm?id=shale-gas-and-hydraulic-fracturing>; <http://www.scientificamerican.com/article.cfm?id=drill-for-natural-gas-pollute-water> and <http://www.ft.com/cms/s/0/f290d928-3866-11df-aabd-00144feabdc0.html>. (Business Line 111010, Prayas Energy Group, Pune)

## POWER SECTOR

### Coal-based Merchant Power Projects

#### A threat to Ecology and Livelihoods

*EAS Sarma (former Power Secretary, Govt of India)*

While India is seriously engaged in global climate talks, it has simultaneously launched a highly misconceived plan to set up private "merchant" power plants based on coal. It has literally become a laissez faire strategy, without any concern for the livelihoods of the people whose lands are forcibly taken away and without any consideration whatsoever for protecting the precious ecology of the country.

Coal-based thermal power plants are expected to cater to steady demand for electricity. That explains why they are called "base load" power stations. There are operational constraints to switching on and switching off these power stations at will, to meet peak loads that occur for limited periods during day. Usually, in the Indian context, not more than 50% to 60% of the electricity demand in any region is steady in this sense. As hydro-electric power plants (even open-cycle gas-based power plants) are more suitable for meeting the residual peak demand, an optimal base-load vs peak-load generation mix in line with the demand pattern, is

recommended. If the proportion of thermal is in excess of this, the thermal power plants will be forced to back down often during the day. It will constrain the thermal power plants from reaching their full capacity levels, resulting in a higher unit cost of electricity imposed on the consumer and causing peak-time shortages that debilitate the economy.

At a more conceptual level, India should have addressed its electricity planning exercise more from the side of demand management<sup>1</sup> than from the supply side. It should realize that "negawatts" are cheaper to obtain and less destructive, compared to megawatts that destroy the ecology and the livelihoods of the people.

Taking undue advantage of the laissez faire merchant power policy initiated by the Centre, the Andhra Pradesh government has permitted a large number of developers to choose the sites they want and set up power plants as they like, wherever, in whatever form they wish. As of now, about 40,000MW of capacity has been committed and sites already allotted to accommodate that capacity.

The developers, instead of negotiating and buying the lands directly from the farmers, have coaxed the govt into either forcibly acquiring private lands for the developers, or allocating to them government lands of their choice, both at throw-away prices.

One can appreciate the wider implications of this policy by looking at specific examples. Three sites, each running into thousands of acres, are wetlands that the Centre has vowed to identify and protect in its Cabinet-approved National Environment Policy. India is committed to conserve wetlands under the Ramsar international Convention on Wetlands and two other international conventions, one on conservation of migratory bird species and another on conservation of bio-diversity. In almost all these cases, the Environment (Protection) Act, 1986, AP Water, Land and Trees (State) Act, 2002, several rules and regulations to protect water bodies and greenery etc. have been violated by the companies and the government.

Coal-based power plants contribute significantly to green house gas emissions. Added to this, wetland degradation is also a major contributor to GHG emissions. The secretariat of Ramsar Convention has issued an advisory to member countries to prevent any such degradation to protect the global climate. Having submitted numerous "compliance" reports to Ramsar Convention, internally, India's Environment Ministry has chosen to ignore its commitments when it came to this obnoxious merchant power policy.

<sup>1</sup> Editor: This should include the issue of demand side management during peaking hours and also ensuring optimum generation from peaking stations during peaking hours. Neither of these issues is getting the desired attention.

One site of another thousand acres is covered under an irrigation project constructed by the government agencies out of the funds allocated under the Tribal Budget, meant for the tribals. There is another project for which 1100 acres of land has been allotted; out of which 730 acres are within CRZ (it reminds one of the Adarsh Housing Society scam in Maharashtra). Both the Centre and the State have jointly suppressed the facts in this case to wink at the developer misusing the land for a decade. MOEF even went out of its way to revive an environment clearance that had lapsed long ago.

These projects have rendered many farming communities homeless and deprived several fishing households of their traditional fishing rights. A more disconcerting aspect of this merchant power policy is that the State has not cared to regionally disperse these power projects to minimize their possible cumulative impact on the people.

In Srikakulam district alone, for example, including the proposed nuclear power plant at Kowada, about 10,000 MW of capacity has been mooted. The National Environment Appellate Authority has commented on this adversely and suggested a more comprehensive and integrated assessment of the environment impacts of such projects.

In Nellore district, within 5 km of Krishnapatnam Port, the State has permitted a whopping 28,000 MW of coal-based thermal generation capacity to come up! All around Krishnapatnam, these power projects will create a pollution cauldron, unprecedented in the country. Assuming that these power plants will burn domestic and imported coals in the ratio 70:30, once they start operating, they will burn 400,000 tonnes of coal daily, spew out 141,000 tonnes of ash per day on the ground, into the water bodies and into the air, deposit 20,720 tonnes of sulphur per day and 15,000 tonnes of nitrogen into the air, in addition to many other toxic particulates such as mercury, arsenic, zinc, cadmium and possibly some radioactive isotopes that have been found in coal. A generation capacity of 28,000 MW will drain 84 million cubic meters of water every day from the sea nearby and pump back large quantities of concentrated salt water and heat into the sea waters to destroy the marine resources!

It is inexplicable how a responsible State has acceded to this. It is far more inexplicable how MOEF has started clearing these plants, project-by-project, without looking at the cumulative impact of such a large number of plants on the lives of the people and their environment. These facts have been brought to the notice of Shri Jairam Ramesh, Minister of State for Environment and Forests but he has chosen to remain silent so far. If all these projects are allowed to come up, he will be presiding over the greatest environmental disaster ever to happen in the country. His Ministry, instead of discharging its obligation under Article 48A of the

Constitution, will create a pollution hub unparalleled in the history of industrialization in the country.

These merchant power plants are supposed to earmark about 20% of their power to the State and sell the rest to other consumers. It is doubtful whether all of them can ever operate to their full capacity. Knowing the dubious track record of many of these private power plants, they are sure to become mill stones around the neck of the State soon, like the infamous Dabhol (erstwhile Enron) project. One should not be surprised if these projects debilitate the finances of the State utilities and even the finances of the State itself, once they come up.

These plants call for a large well-planned transmission system which is yet to get conceptualized. It shows how ill-planned and ad hoc is the decision to permit such a large number of projects to come up all at once, concentrated in small localized areas. Andhra Pradesh is not alone in this environmental mayhem. Karnataka, Maharashtra, Chhattisgarh, Jharkhand, Arunachal Pradesh & several other States are queuing up to woo these same developers to coax them into setting up similar plants that will destroy their own respective environments!

The merchant power policy of the States is apparently prompted by reasons extraneous to power development. There have been reports that illegal links exist between some of these developers and the errant mining companies that have been similarly given mining leases in some of these States. Perhaps, an apt way to describe all this is to call it "corruption electrified".

I appeal to the government into revisiting this policy and ensure that development projects serve the public interest, not promote private plunder. Merchant power policy of the government has little to do with "development" of the economy and it has more to do with extraneous factors. The government has not looked seriously at alternative sources of energy, including "negawatts" that will provide electricity at a much lower cost to the economy, cause no displacement of people and no disturbance to the ecology. ([eassarma@gmail.com](mailto:eassarma@gmail.com), <http://eassarma.in>)

**Capacity trading in Power Market** Currently, only generated power is traded. But now the Central Electricity Regulatory Commission wants to usher in trading of power capacity. Under the model mooted by the regulator, load despatch centres will buy large generation capacity from plants which can ramp up generation at a short notice and feed power to the grid in the event of falling frequency during the peak hours. National and regional load despatch centres will pay to generators for keeping their merchant capacity on standby. The cost will be recoverable from consumers as quality power charge. Gas and hydro power plants are the most reliable sources for meeting peak power requirement as generation from them can be easily ramped up.

Capacity trading is already in place in Europe and America where power markets are well developed. However, this is yet to become a reality in India. Financing power plants with 100% merchant power plants is still supposed to be risky in India given that power supply from them is not tied up. However, the scenario would radically change when the CERC moves forward on capacity trading. Since gas-based power plants can be easily started and shut down as per convenience, capacity addition in gas-fired merchant power generation is likely to get a major boost from capacity trading. (Financial Express 291110)

## QUOTES

**"I wish some day the Prime Minister of India announces that that the poverty in India is reducing at 9% per annum & not that the GDP is rising at 9%."**

*Late L C Jain (Bhaskar 291110)*

"The 7777 ha of the Ridge and the 9700 ha of the Yamuna floodplain (in Delhi) are not just real estate opportunities for all and sundry, but the lungs and kidneys of the National Capital Region (NCR)."

*(Deccan Chronicle 270910)*

## SOUTH ASIA

### **ISDA Task Force Report: WATER SECURITY FOR INDIA: THE EXTERNAL DYNAMICS, Sept 2010**

Some notable extracts: "The hydrological contours of India, both as an upper riparian and a lower riparian, will be at the epicentre of new riparian politics and diplomacy over trans-boundary rivers... India's riparian relation with its neighbours will become progressively fragile with Pakistan, Bangladesh and Nepal continuously raising concerns over regulating and sharing of river waters." (Exec Sum)

"Resource nationalism will increasingly dominate the hydrological contours of South Asia and will largely define regional politics." (Exec Sum)

"International laws on allocating water within river-basin are difficult to implement and often contradictory. The UN Convention on the Non-Navigational Uses of International Watercourses approved in 1997 by a vote of 104-3 (but not yet ratified) requires watercourse nations (Article 5) to participate in the use, development, and protection of an international watercourse in an equitable and reasonable manner... Burundi, China and Turkey (upper riparians) voted against the convention, India (middle riparian) abstained. While Bangladesh (lower riparian) voted for, Pakistan abstained. Of the other trans-boundary South Asian states, Nepal voted for and Bhutan was absent... The Convention was adopted by a vote of 103 in favour to 3 against with 27 abstentions." (Exec Sum, p 28)

"Under the draft provisions of the International Law Commission 'Responsibility of States for Internationally Wrongful Acts, 2001', India can consider the abrogation of the treaty so long as it is proportionate to infringement by the other side. It is well established that Pakistan aids and abets terrorist actions from its soil. India should quantify the damage it has sustained over the decades because of Pakistani support to terrorism and seek as a first step suitable compensation. If Pakistan does not comply, India can possibly threaten to walk out of various bilateral agreements including the IWT."

China: "China will maintain a strategic silence on its water diversions. It is an important threat multiplier and creates downstream riparian fears. Some of water data figures suggest that roughly 354 BCM of water flows from Tibet into India, of which 131 BCM is accounted in the Brahmaputra."

Rather problematic suggestion: "As a counter-measure to China's plan for the diversion of the Yarlung-Tsangpo, India should propose a south Asian-China-ADB power project with international support on the Great Bend." (Page 51)

## NEPAL

**Indian and Chinese companies compete for Upper Tamakoshi HEP** To be built on the Tamakoshi river in Dolakha district in northern Nepal, the NRS Rs 35 billion 456 MW project, is being developed by Upper Tamakoshi Hydropower Ltd, a subsidiary of the state-run Nepal Electricity Authority. It is being funded by NEA, UTHL and Nepal's Employees' Provident Fund, that is providing a long-term loan of NRS 10 billion. Sinohydro has already been awarded the contract for the main civil construction work. This entails building a tunnel, dam and powerhouse.

Three Indian companies and an Indian joint venture are vying with three Chinese companies for the remaining contracts, underscoring the two giant neighbours' growing interest, presence and eventual rivalry in Nepal's energy industry. Larsen and Toubro, and Mumbai's Jyoti Structures Ltd and KEC International Ltd are the three Indian companies that have been shortlisted from nearly a dozen for turnkey operations including laying transmission lines and building a substation for the Hydroelectric Project, Nepal's biggest hydel project being built with domestic funding. The Indian joint venture in the fray is partnered by Spain's Cobras Instalaciones Y Servicios and the New Delhi-based Aravali Infrapower Ltd.

The increasing Chinese presence in Nepal's infrastructure industry - ranging from hydropower projects to hotels and housing - is borne out by the three pre-qualified Chinese companies: Sinohydro Corporation, Central China Power Grid International Economic and Trade Company, and Shanghai Electric Power Transmission and Distribution Engineering. (The Economic Times 221010)

**PAKISTAN**

**Pakistan and India in Dam-building Race** In Kashmir's Neelum Valley, part of which is controlled by India and part by Pakistan, a high-stakes engineering race is taking shape. The two countries are building hydroelectric power plants on the Neelum River, an Indus River tributary. Pakistan's 969-MW Neelum-Jhelum project is 160 km downstream from the Kishanganga project and is located on a tributary of a river granted to Pakistan under the IWT. A 28-km tunnel will divert water from the Neelum to the NJP dam's powerhouse. The engineering firm that won the US\$1.5 billion contract, China Ghazoba Group of Companies, has slowed down construction because of inefficient tunnel-boring machines, according to Pakistani media reports. The project will be completed in 2018, two years behind schedule, at the current pace. This has drawn much ire from Pakistani officials because India may gain priority rights on the Neelum with the Kishanganga project, with current target date of 2016.

The relevant section of the IWT is annexure D, paragraph 15, clause iii, which allows India to divert waters from tributaries of the Jhelum to another tributary only to the extent that it does not adversely affect an existing use in Pakistan. If Pakistan's NJP is first to the line, it can establish a pre-existing use on the river and claim that India's planned diversion will cause it undue harm, said Neda Zawahri, a political science professor at Cleveland State University. Pakistan argues that the Kishanganga project will reduce flows by 15-20 % and limit the NJP's power-generating potential, resulting in an annual loss of US\$400 million.

Pakistan filed a 'dispute' in May 2010 against the Kishanganga project—the third and highest category of contention in the treaty's language. A seven-member international arbitration panel is being assembled to hear the case, the first to be taken to such a level. Stephen Schwebel, a former president of the International Court of Justice, was selected in October 2010 to lead the seven-member arbitration panel. (The circle of blue 301110)

**The World Bank's Indus Indictment** The *Sindhu Bachao Tarla* of Pakistan held a 3-day hunger strike before the World Bank office in Islamabad during 12-14 Oct 2010. More than 70 men and women participated and said, "This is not the first time that we, the Taunsa Barrage victims, are observing peaceful hunger strike in front of the WB Office. The first such hunger strike was held in Feb 2007. At that time, our main demand was the establishment of an independent investigation commission on the WB financed Taunsa Barrage Emergency Rehabilitation and Modernization Project. The project loan was approved on an emergency basis, the justification that catastrophic barrage failure could occur in the near future. We asked the Bank to mandate the proposed investigation commission to ascertain the necessity & appropriateness of engineering interventions

in the name of rehabilitating and remodelling Taunsa Barrage. Further we informed the Bank that the project had displaced hundreds of families, destroyed river environment, but also warned that the flooding problems would be exacerbated in the future owing to flawed engineering interventions. However, our concerns were dismissed by the World Bank."

The statement added, "Today we are again holding a hunger strike to inform the Bank that the rehabilitation and remodelling works financed under its project failed to avert the risk of barrage failure. Rather, the evidence on the ground shows that the numerous 'faulty' engineering interventions directly contributed to barrage failure and thus caused the unprecedented flood disaster in Muzaffargarh District. The flooding in Muzaffargarh District began with the breach in Abbasswala Bund. As a result, an unknown number of lives have been lost, 2 million people were displaced, their crops, animals, houses and other sources of livelihoods washed away." To put it simply the remodelled and modernized barrage, its associated works, was a significant, in fact, the major, cause of the flooding of Muzaffargarh district, the statement concluded.

**Demands** The hunger strikers demanded the establishment of an independent investigation commission to ascertain the specific causes of the structural failure of Taunsa Barrage. The judicial enquiry currently undertaken at the Lahore High Court, on embankment breaches and other aspects of the Indus floods in Punjab, should be an open, public hearing and official reports and data submitted should be accessible by all. Its current secretive modality is unacceptable. Thirdly, the World Bank should cancel the payment of the project loan in order to allocate it entirely for flood recovery and reconstruction in Muzaffargarh District. The urgent demand in this regard is the commitment to prepare the second resettlement plan for two hundred families displaced during the project. They are now once again displaced due to the barrage failure.

Moreover both the World Bank and Asian Development Bank are steering the Flood Damages and Needs Assessment. SBT protested against the sheer lack of consultation with the flood affected groups and their participation in this process. In damages and needs assessment process, the World Bank should recommend the Punjab Government to impose flood tax on urban property and other sources of wealth. If the Bank fails to do so, it will be understood that the Bank is only concerned in increasing its own disbursements.

Finding the World Bank response to the above statement completely inadequate, the *Sindhu Bachao Tarla* is organizing two-day Indus People's Tribunal/Assembly (*Sindh Saagar Sath*) to be held on 11-12 December at Taunsa Barrage. The representatives of both the World Bank and Provincial Irrigation Department are invited to attend the last day session. (*Sindhu Bachao Tarla* 291110)

**Publications available with SANDRP****PUBLICATIONS IN ENGLISH:**

1. *Trapped! Between the Devil and Deep Waters: The story of Bihar's Kosi River* DK Mishra, SANDRP-PSI 2008 Rs 595/-
2. *Large Dams for Hydropower in NorthEast India* SANDRP-Kalpavriksh, June '05, p 228, Rs 150 (indy), Rs 300 (inst)
3. *Tragedy of Commons: The Kerala Experience in River Linking*, River Research Centre-SANDRP, '04, p 146, Rs 120
4. *Unravelling Bhakra*, Shripad Dharmadhikary, Manthan, 2005, pp 372, Rs 150/- (individuals); Rs 300 (institutions)
5. *THE GREATER COMMON GOOD* by Arundhati Roy, Published by India Book Distributors, 1999, pp 76, Rs 80/-
6. *Water Private Limited* Manthan Adhyayan Kendra, 2006, pp 124, Rs 50/-
7. *Dams, Rivers & Rights: Action Guide*, IRN, 2006, pp 38, Rs 20/-
8. *Conserving Raindrops a Much Better Option than Linking Rivers* by Bharat Dogra, pp 8, Rs 4/-.
9. *The World Bank as a Knowledge Producer* Manthan, March 2008, pp 80, Rs 100/-
10. *Economics of Hydropower* by Bharat Jhunjhunwala Rs 750, Kalpaz Publications, 2009, pp 306
11. *There is little Hope here: Civil Society View: India's National Action Plan on Climate Change*, SANDRP, 2009 Rs 100

**PUBLICATIONS IN HINDI:**

1. *Bandh, Nadi evam Adhikar Dam Action Guide for Communities*, SANDRP, 2007, pp 44, Rs 30/-
2. *Ken-Betwa Nadi Jod: Pyasi Ken Ka Paani Betwa Mein Kyon?*, SANDRP, 2004, pp 46, Rs 20/-.
3. *Bade Bandh, Bharat ka Anubhav*, SANDRP, 2001, pp 268, Rs. 100/-.
4. *Bhakra: Parat-dar-parat ek padtal* Books for change, 2007, p 190, Rs 100/-
5. *Behtar Bijli sewa ke liye Jagrukata aur Karyakram: Samuday ke liye Agenda* Prayas, 2008, Rs 30/-
6. *Jal Vidhyut ka Sach (Hindi)* By B Jhunjhunwala, pp 61, Rs 10/-.
7. *Dhol main Pol: Srinagar HEP in Uttarakhand*, MATU (Delhi), 2009, Rs 10/-
8. *Ganga ki Bhrun Hatya*, MATU (Delhi), 2008, Rs 60/-
9. *Ganga ke maikhe main* Matu (Delhi) 2008, Rs 25/-

Please send your orders with DD in favour of *Dams, Rivers & People*, payable at Delhi and send them to DRP, c/o 86-D, AD Block, Shalimar Bagh, Delhi 110 088. Please add Rs. 25/- for postage and packing charges for all publications.

**अब बनेंगे बांध आंसू के**

कोई कोना देश का  
बांध बांधने से बचा नहीं.  
नदी का किनारा  
पाट से अछूता नहीं.  
नाली के पानी तक को बांधने की  
योजना चल पडी है.  
सागर के पानी पर  
देशों में बंटवारा हो चुका.  
नदियां अब बिक चुकी  
धरती का पानी अब बचा नहीं.  
लगते लगाम आंसू पर  
अब बनेंगे बांध आंसू के.

अलोका कुजुर (<http://www.cgnetwara.org/index.php?id=2171>)

**Dams, Rivers & People** The annual subscription for the *DRP* is Rs 125/-. Please send a DD in favour of "Dams, Rivers & People", payable at Delhi, to our Delhi address (DRP, c/o 86-D, AD block, Shalimar Bagh, Delhi 110 088). Or, you can send money order to Delhi address. Subscriptions can be sent for multiple years at the same rate. The *DRP* is also available in electronic versions and can be accessed at [www.sandrp.in/drpinde](http://www.sandrp.in/drpinde).

Edited, Published, Printed & Owned by Himanshu Thakkar at 86-D, AD Block, Shalimar Bagh, Delhi – 88  
Printed at Sun Shine Process, B-103/5, Naraina Indl. Area Phase – I, New Delhi – 110 028