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Lead Piece

The National River Conservation Authority has not met at all during UPA rule

Why is the UPA showing such utter disdain for Rivers?

The disdain that our politicians, engineers and bureaucrats have for rivers is well known. Even then the indifference that the UPA I and now UPA II is showing towards rivers seems shocking.

There can be different ways that this can be shown. Let us look at the government's most important river conservation initiative called the National River Conservation Authority. The Authority is chaired by the Prime Minister, no less. And believe it or not, that authority under the Prime Minister has not met at all since June 16, 2003, when the last meeting of NRCA was held. What this means is that during the entire five years of UPA I and also the last fifteen months of UPA II, the NRCA has not met at all. Even the steering committee of the NRCA, chaired by secretary, Union Ministry of Environment and Forests, has not met since December 20, 2007, when the 52nd meeting of the committee was held. What this means is that for the last 32 months, including the entire period of UPA II, the steering committee has not met. Even between June '03 and Dec 2007, the Steering committee met just four times. It is supposed to meet every quarter, incidentally.

Remember that this is the flagship, National and only programme of the government for conservation of rivers. Remember also the roots of the programme was in the Ganga Action Plan started by the then Prime Minister Rajiv Gandhi in 1985. The apex governing body of the Ganga Action Plan was the Central Ganga Authority, chaired by the Prime Minister. On Sept 5, 1995, the CGA was converted into the NRCA, since the GAP had expanded to become National River Action Plan. One would think that the connection with Rajiv Gandhi would provide a better treatment in this regime, but even that hope is misplaced, it seems.

Importantly, some of the key functions of NRCA include: To lay down, promote and approve appropriate policies and programmes, to examine and approve priorities of NRCP, to review progress of implementation and give necessary directions, among others. Similarly, the steering committee too has very important functions to perform in its quarterly meetings.

When we asked about this, the officials of the MEF said in their written reply, "Revamping of the river conservation strategy was initiated in 2007 by the Government and the process led to the setting up of National Ganga River Basin Authority in Feb 2009 for conservation of river Ganga with a river basin approach. The first meeting of the NGRBA was held under the chairmanship of the Prime Minister in

October 2009. The experience of this revised approach would be adopted for conservation of other rivers."

This response does not answer any questions, but only raised more. Does the constitution, structure, objectives laid down, the functioning of the authority for the last 19 months and the conduct of its first meeting of the NGRBA raise any hope for better future of our rivers? Is there any difference anywhere here that shows that Ganga or other rivers for which the same approach is to be adopted are going to be treated any better? Unfortunately, we see no positive signs in any of these.

Incidentally, the process initiated in November 2007 through a cabinet note from MEF mentioned in the MEF reply above resulted in a naught. This is because, on 24.7.2008 this note was considered in the cabinet and a decision was taken to form a Group of Ministers, but again, disturbingly, that GOM never found time to meet and got disbanded with the formation of UPA II.

Our rivers, including Ganga have bleak future. Even Mr Jairam Ramesh, who gets such high marks from many observers for his handling of environment issues on many other counts, has given absolutely no hope for rivers. The conclusion is inescapable: the disregard of UPA I and II for our rivers is unprecedented.

SANDRP

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Unprecedented floods in Ghaggar Basin

Swarup Bhattacharya and Vineet Kumar travelled to affected areas during floods in Ghaggar basin in Punjab and Haryana and bring this report from the ground

In the first and second week of July 2010, Punjab and Haryana state experienced massive flood disaster in the Ghaggar River basin. Ghaggar and its tributaries breached embankments one after another along its stretch and flooded vast areas. Over 2 lakh ha of agricultural land have been affected in Punjab and Haryana, scores of people and hundreds of cattle have died, houses, roads, bridges, railway lines and canals have been damaged. There were also breaches in canals, leading to transfer of flood waters to other parts of the basin far away from the rivers, spreading floods to areas that should not have experienced floods. Punjab and Haryana Govts have demanded financial assistance to the tune of over a thousand crores each from the Central govt.

Ghaggar, a west flowing river originates in Shivalik hills of Himachal Pradesh flows through Haryana, Punjab, Chandigarh and Rajasthan and disappears in the Thar Desert of Rajasthan. Tangri, Markanda, Saraswati, Pachhisdhara are the few important tributaries. Total basin area of Ghaggar is 32132 sq km.

Villagers residing in the upper catchment of the Ghaggar in Patiala and Ambala Districts have mentioned that the river flow was abnormally high from 5th to 8th July, 2010 due to which the river overflowed and submerged its flood plain at many places. Haryana and Punjab govt. blamed each other for the blockade of river flow and diversion of water. But both of them have raised their fingers on an unprecedented downpour in the catchment of Ghaggar River. Heavy discharge and human interference in the natural flow of river water along with the lack of maintenance of embankments and canals are supposed to be the causes for such a massive loss of life and property of the common people residing in the Ghaggar basin.

Asst. Engineer, Patiala Drainage Division, Punjab told SANDRP that in Patiala District alone, 73 major and minor breaches have occurred in the first quarter of the rainy season in 2010. Here, a breach means the breakdown of manmade barrier called embankment on the both side of the river. He pointed out that Sangrur District of Punjab has completed Ghaggar Channelization process of River Ghaggar just like Sirsa of Haryana District. The Channelization project consists of putting new embankment discarding the older ones.

Pachhisdhara, a tributary of Ghaggar received heavy flow and it overflowed in Punjab in the first week of the July. Main stream Ghaggar along with Markanda and Tangri were full of water during that period. On July 6, Ambala and Patiala District received breached water and that flood water, along the slope of the basin, started

moving in the south-west direction. On 22nd July, flood entered into Hanumangarh District of Rajasthan.

Chronology: How the flood unfolded and travelled

July 6, 2010

- Ambala Cantonment, Ambala city was flooded due to a breach of embankment nearly 5 km North East of the town on Tangri River.
- Parts of the Shahabad town of Ambala District submerged due to a breach on Markanda River.
- Left bank of Sutlej-Yamuna Link Canal (SYL) breached near Jyotisar, Kurukshetra District, Haryana. Thanesar, Kurukshetra, Didar Nagar, Shanti Nagar and Jyotisar got affected.

July 7, 2010

- Another breach occurred 8 km upstream of the previous day breach site near Jyotisar on SYL.
- Ghaggar water spread on both sides of the river near Tatiana, Kaithal District of Haryana. Bordering villages of Patiala District of Punjab flooded. Punjab blamed Haryana for blocking river flow at the siphon site of Ghaggar with Hansi Butana Canal.
- Pachhisdhara water overflowed and inundated Bada Kammi, Lachhuroo, Sarala villages of Patiala District, Punjab.

July 8, 2010

- Ghaggar water breached Hansi Butana Canal and water entered into the HBC (at 0030 hrs) near Tatiana.
- Right bank of the HBC near Tatiana breached at 0330 hrs.
- Pachhisdhara breached left bank of SYL at two places near Bada Kammi, Punjab. Pachhisdhara flow entered into SYL.
- Two more breaches on Pachhisdhara near Mahdudan village, Punjab.
- Bibipur Lake near Jyotisar breached.

July 9, 2010

- Right bank of HBC breached near Keorak, Kaithal District, Haryana.

July 11, 2010

- Three breaches on Rangoi Nallah in Fatehabad District, Haryana. 77 villages affected.

July 12, 2010

- Ghaggar breached near Moonak, Sangrur District of Punjab. 12 villages affected.
- Two breaches on Ghaggar near Sardulgarh, Punjab. 30 villages submerged

July 13, 2010

- Two breaches downstream of Ottu Weir in Sirsa District, Haryana. 6 villages affected

July 14, 2010

- Two more breaches down stream of Ottu Weir. 8000 acres of land and 13 villages affected

July 15, 2010

- Outer embankment breached near Jhopra in Sirsa District. Ellenabad of Sirsa District affected.

July 22, 2010

- Hanumangarh District of Rajasthan affected

Ghaggar floods could be seen in two ways; one is breaching of embankments and spreading of river water in the fields. Another way to look at it is how the Ghaggar water entered the ill designed and ill maintained canals like SYL and HBC and spread to far off areas. Let's see how water entered the two defunct canals (they are yet to be commissioned and are supposed to have no water) and how those two canals instead of providing irrigation water destroyed the standing crop.

Sutlej-Yamuna Link canal (SYL) with the capacity of 2000 cusecs (cubic feet per second), was built in 1989-90 (90% of the entire canal was built except some portion in Punjab and its head work near Anandpur Sahib) to divert water of Sutlej river to Yamuna. Since then, due to Interstate dispute on sharing of river water between Punjab and Haryana, the SYL canal is yet to be commissioned. Villagers told us that throughout the year, the SYL (though it is not functional) has retained some water. Since its inception, SYL was not maintained properly. Asst. Engineer, Patiala Drainage Division, Punjab, mentioned that the water from the area around the canal in the Punjab region also seeped and entered into SYL through cracks on the wall of SYL. Haryana farmers blamed Punjab farmers for throwing excess water of their fields to SYL by deliberately puncturing the wall of the canal. It has been observed that in Bada Kammi village, the farmers of Punjab were pumping water from the SYL whereas in Haryana portion of the SYL, we could not see a single such pumpset along the SYL (Haryana farmers criticized the state govt. for not giving permission to pump water from the SYL).

Left bank of SYL near Jyotisar, Kurukshetra District of Haryana breached on July 6, 2010 and flooded the surrounding area. Breached water spread up to Shanti Nagar and Didar Nagar of Kurukshetra city. Just 50 meters upstream of the breached site, Saraswati River and a sewage drain of Kurukshetra are crossing the SYL. Flood water also spread on the other side of the SYL through these cross drainage structures and flooded Jyotisar area. Mr Mithun Lal, Beldar (watchman) of Haryana Irrigation Department who was posted at the breach site near Jogan Khera village of Jyotisar told SANDRP that 10 days before the breach on July 6, the same breach point was under repair from earlier breach.

He said that the negligence to make that temporary plug into a permanent one is one of the main cause for the breach on July 6 and inundation of vast areas of the district. Another breach of SYL occurred on the very next day just few km upstream of the Jyotisar breach point.

Pachhisdhara, a small tributary of River Ghaggar originates near Chandigarh and confluence near Sarala village in Patiala District of Punjab. This tributary also receives sewage water from Chandigarh Drain. Punjab villagers have mentioned that Pachhisdhara was flowing beyond its capacity on 6th, 7th and 8th July 2010 and water overflowed at many places near Bada Kammi, Lachhuroo, Kapuri,

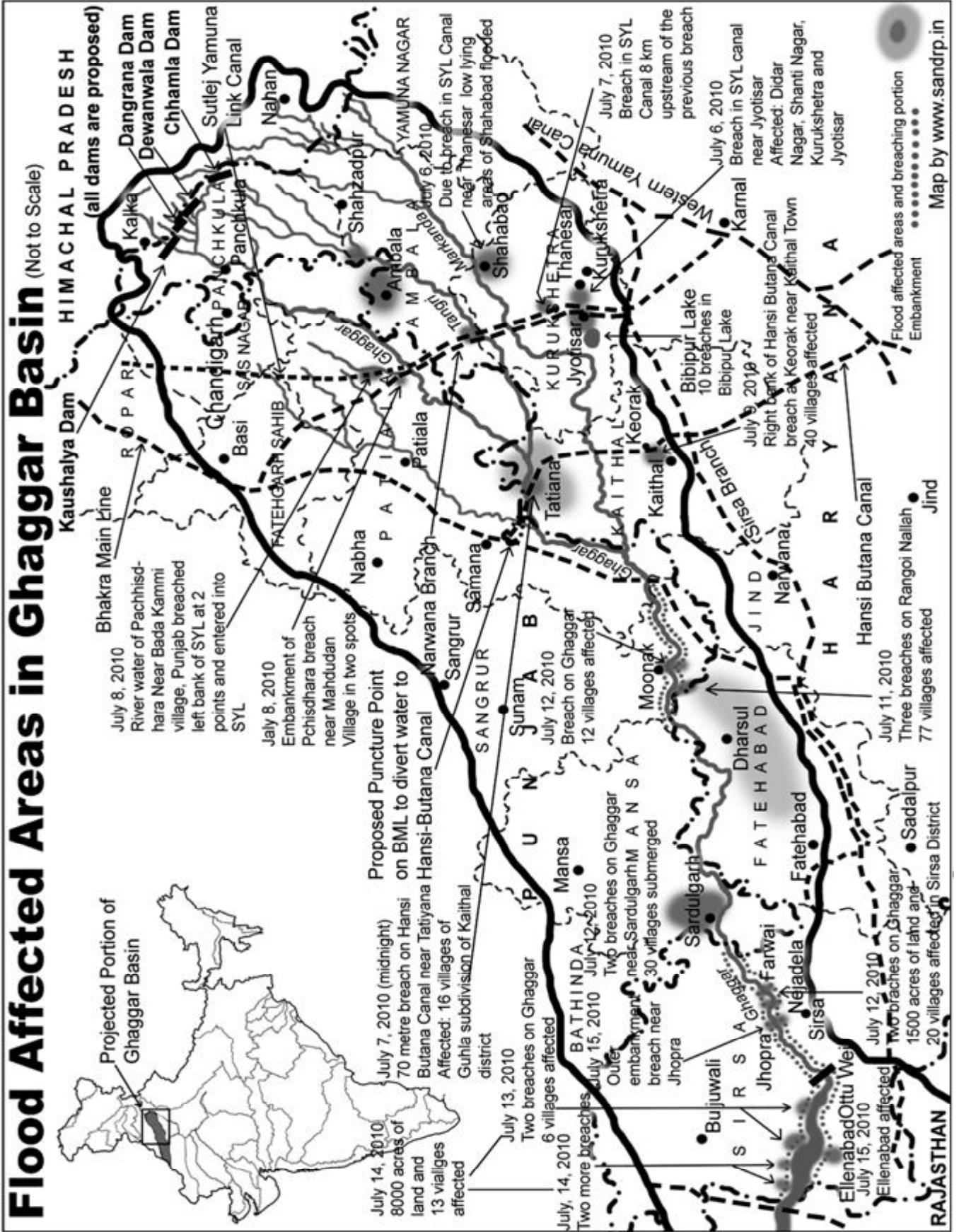
It is clear from this sequence of events that flood water entered the ill maintained SYL and when the canal breached at downstream locations, it spread the floods to new locations that may not have been flood without such breaches. Thus SYL was instrumental in bringing floods to new areas. The lack of proper maintenance of the canal both in Punjab and Haryana was a major reason. This story of ill maintained canals creating disasters is not limited to SYL, it seems, as we see below for the Hansi Butana Canal, another yet to be commissioned canal of Haryana.

Sanjanpur, Sarada, Raipur, Bada Lachhuroo. Assistant Engineer of Punjab Drainage Department, who is in-charge of this region, told us that Pachhisdhara had breached the left bank of SYL near Bada Kammi village in the early morning of 8th July, 2010. But the breach was plugged. Another breach occurred few hundred meters downstream of the plugged site but this breach could not be plugged. Eventually, 100 feet breach developed by about 10 am

on the same day and the water of Pachhisdhara entered into the SYL. Assistant Engineer also said that two more breaches occurred on the embankment of Pachhisdhara near Mahdudan village but there the flood water did not enter into the SYL.

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Hansi-Butana Canal Hansi-Butana Canal (HBC), a project of Haryana Govt., officially known as BML-HB-BB-MPLC, was completed for most of its length in 2008-09 at a cost of Rs 400 crores to take Sutlej water to Hansi and Butana region of Haryana. It is supposed to carry 2086 cusecs of water through its brick-lined canal. As per the project design, it is supposed to get water after puncturing the BML (Bhakra Main Line) when it enters into Haryana for a brief stretch in Kaithal District near Samana in Punjab.



The canal is yet to be commissioned since Punjab and Rajasthan, who have share of water in the BML, have opposed this and Haryana did not get their consent before building the canal. The case is now pending in the Supreme Court.

On 7th July midnight at about 0030 hrs in presence of senior officials of Haryana Irrigation Department, a massive breach (about 70 m) occurred on the left bank of the HBC at Kharal Village. This left bank of the HBC is also the left embankment of River Ghaggar (note that the flow of water in HBC and Ghaggar is in opposite directions). Mr. Arvind Kaushik, XEN (Executive Engineer), Irrigation Department, Kaithal, Haryana told SANDRP that Ghaggar received heavy discharge due to rains and inundated flood plains in Kaithal District of Haryana and Patiala District of Punjab. Flood water created pressure on the left embankment near Tatiana and breached the embankment. Irrigation department of Haryana Govt. claimed that on 8th July Ghaggar water reached 27.50 ft in the gauging station near Tatiana which was 2nd highest in last 26 yrs.

Some of the recent High Ghaggar River Discharges at RD 140000 of Ghaggar Bund (near Tatiana)			
Date	Year	Gauge in ft.	Discharge (in Cusecs)
26-09	1988	25.40	56353
12-07	1993	30.40	100000
06-09	1995	27.10	62070
06-08	2004	27.00	61730
08-07	2010	27.50	63460

Villagers of Khambheda, a flood affected village near Tatiana, told us that after 1993, they have for the first time witnessed such a massive downpour as well as heavy discharge of river Ghaggar. They also mentioned that the floods of 1993 hadn't affected them so much but this flood had taken everything from them. They pointed out that the siphon of HBC on Ghaggar River had obstructed the natural flow and hence, backwater effect inundated the vast areas.

The Punjab govt. has also blamed the Haryana govt. on the same ground of inadequate capacity of the siphon for flooding of Patiala District of Punjab. Another villager said that the large number of pillars of the siphon had obstructed the natural flow. Mr. Arvind Kaushik, XEN replied that in 1993, the level of flood water in Ghaggar River increased from 21ft to 30 ft in one week at the same

gauge station near Tatiana but in 2010, the level of flood water increased from 16ft to 27ft in just one night of 6th-7th July.

Mr. Arvind Kaushik, XEN denied this claim and supported the structural design of siphon by saying that the capacity of that siphon is more than one lakh cusecs (this itself was a gross understatement and an inaccurate figure from the engineer, considering that the design capacity is supposed to be 162300 cusecs) whereas on the night of July 7 the flow in Ghaggar was 63460 cusecs (the discharge capacity of Ghaggar river at the siphon, as mentioned on the board at the site says: 1,62,300 cusecs, see the photo, for other photos of this visit, see: http://www.sandrp.in/floods/Pictorial_depiction_of_Ghaggar_Flood_2010.pdf).

The politics around the capacity of that siphon will actually require a separate analysis and investigation. There is no doubt that the siphon is going to play crucial role in coming years.

Mrs. Gurnaam Kaur, 55 yrs., residing beside the siphon told us that her paddy field was submerged but not affected too much because it was on the downstream of the siphon on Ghaggar River. She clearly mentioned that their fellow villagers whose land was in the upstream of the siphon, were worst affected than her. She was clearly hinting that siphon did act as a block even at the below design flow of 63460 cusecs. In addition to the siphon structure, villagers also blamed the use of poor construction material and negligence of maintenance.

They showed anger against the state govt for misusing Rs 400 crores on the HBC project. During the field visit, we observed that from Tatiana to Siphon site (nearly 4 km), both the banks of the HBC are in bad

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shape.

Just about two years old, newly built HBC again collapsed nearly 25 kms downstream of Tatiana village at RD 160400 (RD is running distance, all in feet, from some starting point, which is the puncture point at BML for HBC). This time, it was the right bank of HBC near Keorak village. Mr. Vijender Singh, 36 yrs, residing nearby village along with district officials were on the spot on 8th July to strengthen the right embankment of the canal but failed to do so. Mr. Singh blamed on the ill function of the cross-drainage structures near its breach portion. He said that the flood water from

HARYANA IRRIGATION DEPARTMENT		
NAME OF STRUCTURE> SYPHON AQUEDUCT RD.36100		
BML HB&B MPLC XING RIVER GHAGGAR RD.134600		
YEAR 2007-08		
DESCRIPTION	BML HB&B MPLC	RIVER GHAGGAR
DISCHARGE	2086 CUSECS	162 300 CUS
BED LEVEL	236.564 MTR	228.167 MTR
HFL	U/S	240.943
	D/S,	240.919
FB.	2.5	
BAYS		48
ANGLE OF XING	90°	90°

Kurukshetra entered into the Kaithal drain and that drain was not properly maintained due to which the water engulfed the nearby areas. This stagnant water created pressure from the outer side on the right bank of the embankment on HBC.

Mr. Arvind Kaushik, XEN, said that in-between Tatiana and Keorak, there are 10-20 water inlets which contribute to the HBC. On July 8, water level of HBC rose significantly and created overflowing situation. He said that the flood water of Ghaggar which entered near Khara

village, Tatiana was not the only reason for overflowing HBC near Keorak. Flood water entering through those 10-20 inlets (mentioned above) and breached water of Bibipur Lake flowing through Saraswati drain (another inlet) contributed to the situation. He pointed out that due to the relatively lower height of the right bank of embankment (at breach point), water came out and eroded the outer wall very fast. Suddenly, a portion of the wall collapsed and water spread near to Kaithal town inundating vast areas.

It is clear from this sequence of events that the ill designed (for example the siphon over the Ghaggar river) and ill maintained Hansi Butana Canal has played a crucial role in spreading the flood disaster in Ghaggar basin to new areas.

Interestingly, twenty years ago, a committee was formed named "Ghaggar Standing Committee", which was supposed to work on the flood problems of the basin. The committee is chaired by a Central Water Commission member and includes officials of Punjab, Haryana and Rajasthan. According to Mr. S. S More, Draftsman, Kaithal Water Services Division, Haryana, "More than 20 meetings have had happened since its formation but no result has come out yet."

No matter how much was the "unprecedented" rain in the catchment of the Ghaggar basin, human interference in its natural flow has caused devastation. In the name of "Channelisation" or embankment, policy makers virtually want to turn a river into a canal. The embankments basically work to rapidly transfer the flood from upstream to downstream areas. Suddenly, when a river basin receives more rainfall than what the ill maintained embankments can safely carry, they pass the blame to unprecedented rains or to the other basin states. In the

name of embankments we are restricting the movement of a free flowing river. We are putting wall in the name of embankment and narrowing its path. Secondly, we are not properly maintaining the embankments. Thirdly, we

are creating additional structures like the canals which are neither properly designed, nor properly maintained.

There are a number of other factors that have contributed to the Ghaggar basin flood disaster. At a number of places the flood plains and even flow paths have been encroached upon by various

builders, with the partnership of the bureaucrats, politicians and the engineers. Secondly, the local water harvesting structures have been poorly maintained. The Building of the HBC itself had illegally encroached into sanctuary areas. Thirdly, exogenous water is entering the basin from the Sutlej and the Yamuna basin and even as parts of the basin was experiencing having rainfall and which was down to create heavy flows in the Ghaggar river, the water from exogenous sources and

groundwater kept entering the surface waters in the basin.

Moreover, there is no coordination between the riparian states. There is no coordination even within the state also. Therefore, when an upstream state/district receives such a heavy

downpour, they don't bother to alert the downstream states/districts. The downstream areas are also not using the information about rainfall, flows in the upstream areas. Many times, the upstream states are trying to hide the facts and starting to blame others.

One of the direct consequences of this could be seen in Sirsa district when the wheat stored in the open and ill maintained godowns got destroyed, when the authorities there had a notice of more than a week that floods there are bound to come considering the upstream events see the map of Ghaggar basin flood that depicts the chronology of events and progress of flood disaster downstream so clearly.

In case of Ghaggar basin the unused, ill designed and ill maintained SYL and HBC have transferred the flood disaster to other parts of the states. The events in the Ghaggar basin in July 2010 have shown the kind of man made disasters we are inviting. It could be a wake up call if we were interested in learning some lessons. Unfortunately, that does not seem to be the case.

There are a number of other factors that have contributed to the Ghaggar basin flood disaster. At a number of places the flood plains and even flow paths have been encroached upon by various builders, with the partnership of the bureaucrats, politicians and the engineers. Secondly, the local water harvesting structures have been poorly maintained.

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Free-flowing rivers around the WorldParineeta Dandekar (parineeta.dandekar@gmail.com)

With around 5100 large dams, India ranks third in the world with regards to the number of large dams. The ongoing debate over the economic, social and environmental costs of large dams has indicated many times that these costs are not commensurate with their benefits. Although we have dammed all our major rivers, (except Brahmaputra and plans to dam its major tributaries are on way, some like Ranganadi have already been dammed), profoundly changing their hydrological, ecological, social and cultural systems, **we are yet to form a legally enforceable policy which states that environmental flows in rivers are a necessity.** It is more than clear now that environmental flows relate to well being of not only 'birds and fishes', but also of the entire human society¹. Take an example of fisheries, lack of flows in rivers and contractor-owned reservoir fishing has affected the livelihood of hundreds of thousands of small fishermen². Environmental flows can also dilute pollution load, so let us not hide behind the fact that pollution is wiping out our riverine fish, not the absence of flows. It is also clear that environmental flows do NOT mean a decommissioning of all the present dams, nor do they mean any random figure like 60% or 10% of Mean Annual Runoff³. Environmental flows (Eflows, using it for lack of better term) require reaching a wise compromise through science and local negotiations, for each river.

While many countries have put in place policies and laws for maintaining environmental flows in their rivers, there

Although we have dammed all our major rivers, (except Brahmaputra and plans to dam its major tributaries are on way, some like Ranganadi have already been dammed), profoundly changing their hydrological, ecological, social and cultural systems, we are yet to form a legally enforceable policy which states that environmental flows in rivers are a necessity. It is more than clear now that environmental flows relate to well being of not only 'birds and fishes', but also of the entire human society.

is also a rarer category: **Rivers which have not been dammed yet, rivers which retain their connection from the source to the sea, nurturing myriad ecosystems and communities in their wake!** These are known by many names like Free flowing rivers, Wild Rivers, Pristine/ Virgin rivers, Heritage Rivers, etc., each indicating their rare character and value. In ecological and cultural terms, the value of these rivers is immense and as more and more rivers are being dammed the world over, this value is increasing steeply. Unfortunately, in today's economic terms, these rivers are still waiting to get their due recognition, but as human systems evolve, they will surely be seen as 'invaluable' service providers with phenomenal use and non use values.

Such free flowing rivers are, as is evident, dwindling fast throughout. Of the 177 large rivers of the world only one third are free flowing and a mere 21 rivers, more than 1000 kms long retain a direct connection to the sea.

Ecologically, free flowing rivers have a huge significance. All natural flow levels have a specific ecological function, including drought level flows, which help in purging exotic species, as well in concentrating game at a smaller place, for the benefit of predators and flood flows, which help in numerous ways like groundwater recharge, nutrient balancing, fish spawning, sediment flushing, etc. Owing to the habitats they provide, the few free flowing/ least modified rivers in India are last refuges of endangered fish species like Giant Catfish, Gangetic Dolphin, Snow Trout, Mahaseer, etc. Free flowing stretches of river Chalakudy in Kerala, where water levels are not strongly affected by dams, support more than 50 fish species, while the National Chambal Gharial Sanctuary, Ken and Son National Parks support thriving populations of Gharials, Mugar and the Ganges River Dolphin. Despite being a Sanctuary, Chambal Gharial Sanctuary had to face turbulent times when a string of four hydropower projects were planned by Rajasthan in its course, affecting its unique biodiversity. That plan, fortunately, has been rejected by the National Wildlife Board.

At the same time, free flowing rivers and stretches also provide innumerable community services like fisheries, tourism, water supply, to name a few. For example, one

¹ Dyson, M., Bergkamp, G., Scanlon, J. (eds). Flow. The Essentials of Environmental Flows. IUCN, Gland, Switzerland and Cambridge, UK. xiv + 118 pp.

² Personal communication with Chairman of National Association of Fishermen,

* Sandhu, J. S. & Toor, H. S. 1984. *Effects of Dams and Fishways on Fish Fauna with Special Reference to Punjab*, in Status of Wildlife in Punjab. Indian Ecological Society, Ludhiana, India. pp 117-124

* D. Jackson et al, *The Influence of Dams on River Fisheries*, Submission to the World Commission on Dams

³ Smahtin, V.; Anputhas, M. 2006. An assessment of environmental flow requirements of Indian river basins. Colombo, Sri Lanka: International Water Management Institute. 42p. (IWMI Research Report 107)

of the small free flowing rivers in the Western Ghats, Shastri, provides drinking quality water to its inhabitants throughout the year, without any dams. Estuary of River Anghanashini in Karnataka provides income to more than 9600 household through collection of bivalves (clams) and mussels alone. There is a very urgent need to assess the ecological goods and services provided by these rivers in order to have a fair cost-benefit analysis of dammed and undammed rivers.

Unfortunately, India does not have any legislation to protect the free flowing status of any of its rivers. In a recent attempt, following many campaigns including but not limited to Dr. G.D. Agarwal's fast unto death, a limited stretch of Bhagirathi (Gangotri to the point of upstream of Uttarkashi at the upstream most limit of reservoir of Maneri Bhalil) had been declared to be free of dams, but now with the Group of Ministers headed by Finance Minister Pranab Mukherjee deciding to go ahead with the controversial Loharinag Pala Hydropower project, that possibility has also dimmed. Considering the very special cultural value of rivers like Ganga and Narmada in the hearts of all Indians, this step, even if it materialises, is too little, too late and rather superficial.

Amidst this scenario, there are many countries which are actively trying to protect these last sentinels from the onslaught of dams and have been devising some ingenious legislative tools to co manage ecology, economy and societal well being.

Amidst this scenario, there are many countries which are actively trying to protect these last sentinels from the onslaught of dams and have been devising some ingenious legislative tools to co manage ecology, economy and societal well being.

So let us, for a change, look at the other side of the story, where policies and voluntary efforts are being made to enable rivers to run free.

There are a number of lessons to be learnt from these cases. Firstly: these policies and laws were not easily constituted. Many Individuals, Civil Society Organisations, Cultural Groups, Nature Groups, Indigenous People's groups, etc., lobbied for them hard and long, and are still doing it. Secondly, these policies are not a mere compromise to keep some groups happy, so that the process of damming other rivers can go on without 'disturbance'. Most of the countries have set criteria for identifying their own Wild and Scenic/Heritage/Wild or National Rivers and have meticulously classified activities that can take place in various stretches of these rivers. Community participation and special attention to indigenous community and traditional water rights are also highlights of these cases. Let us take a brief look at some of these efforts.

WILD & SCENIC RIVERS ACT (1968): USA

The Act specifically "[d]eclares that the established national policy of dam and other construction at

appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfil other vital national conservation purposes."(Emphasis added)

"It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations."

The essence of the Act is protection of **free-flowing character of the river**. Free-flowing is defined in the Act as "existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway". Note that, like it is contested in India that run-of-the-river schemes do not

affect a river, according to this Act, a free flowing river does not include modification in the waterway or straightening. To qualify, a river or river segment must be in a free-flowing condition and must be deemed to have one or more "outstandingly remarkable" scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values.

Each river is administered by either a federal or state agency. The Wild and Scenic Rivers and /or their stretches and tributaries are managed by various Federal and State Agencies like the Bureau of Land Management, US Fish and Wildlife Service, US Forest Service, National Park Service, etc.. In 1995, a Wild and Scenic Rivers Council has been formed with the coordination of the above mentioned agencies as well as any other agencies that have interest in protecting/managing the river.

Jurisdiction of the States over their waters remains unaffected, so long as it does not interfere with the functioning of this law. It also states that the water rights of the affected individuals will be compensated.

Based on their characters, Rivers are classified as Wild, Scenic and Recreational, with varying management in each of the categories. This mechanism allows development of varying degree of places on and along the river.

The Act prohibits federal support for actions such as the construction of dams or other in stream activities

that would harm the river's free-flowing condition, water quality, or outstanding resource values.

As of 2008, the 40th anniversary of the Act, the National System protects more than **11,000 miles of 166 rivers in 38 states** and the Commonwealth of Puerto Rico; this is a little more than one-quarter of one percent of the nation's rivers. **By comparison, more than 75,000 large dams across the country have modified at least 600,000 miles, or about 17%, of American rivers.**

On March 30, 2010, the congress added **1,100 miles of rivers to this Act**. Currently, the number of rivers protected under the **Wild and Scenic Rivers scheme to a total of 252** (American Rivers 2009).

CANADIAN HERITAGE RIVERS SYSTEM 1984

"Canada's outstanding rivers will be nationally recognized and managed through the support and stewardship of local people and provincial, territorial and federal governments to ensure the long-term conservation of the rivers' natural, cultural and recreational values and integrity."

-Vision of Canadian Heritage River System Charter, 1997

The Canadian Heritage Rivers System (CHRS) is Canada's national river conservation program. The CHRS was established in 1984 by the federal, provincial and territorial governments to conserve and protect the best examples of Canada's river heritage to give them national recognition, and to encourage the public to enjoy and appreciate them (http://www.chrs.ca/About_e.htm). It is a cooperative program of the governments of Canada, all 10 provinces, and the three territories. CHRS is a Public Trust and participation in the CHRS is purely **voluntary**.

The system is governed by a Heritage Rivers Board which has members from the government as well as citizens. For a river to be included in the Heritage system, it needs to be nominated and designated. To be considered, the river must have outstanding natural, cultural and/or recreational values, a high level of public support, and the application should demonstrate that sufficient measures will be put in place to ensure that those values will be maintained. One of the important (though not the deciding) criteria related to 'Natural Integrity' is '*absence of human made impoundments in the river course*'.

The river becomes designated as a Heritage River when a **management plan, or heritage strategy**, that ensures the river will be managed to conserve its outstanding natural, cultural and/or recreational values, is lodged with the Board by the government(s) that made the nomination. This plan charts out important activities to be undertaken to protect the river like restoration, environment education, pollution treatment, etc,

Production of a management plan or heritage strategy is based on public consultation and consensus.

The Heritage Rivers Board has published important works relating to "Cultural Framework for Canadian Heritage Rivers" which enumerates the elements of Canada's cultural river heritage and a "Framework for the Natural Values of Canadian Heritage Rivers", which can be used to assess the representation of these elements by rivers in the CHRS, or candidate CHRS rivers.

In a recent happening, an MP of North Alberta voiced strong opposition to an oil sands project, which was about to draw freshwater from the untouched Clearwater River, using the support from his constituents through Clearwater's CHRS status. This is far cry from our country where rivers which are untouched and of great ecological and cultural importance are looked upon as untapped resources, as if we are deriving no service from them currently.

Interesting part is that CHRS does not only work with free flowing rivers, but also on highly developed rivers like Grand and Ottawa, to conserve their heritage characters. **Currently, 38 rivers are designated as Heritage Rivers, while six are nominated.** These rivers represent Canada's diverse social, cultural and ecosystems.

WILD RIVERS ACT, AUSTRALIA

According to the Act, a Wild River is defined as "a channel, channel network, or a connected network of waterbodies, of natural origin and exhibiting overland flow (which can be perennial, intermittent or episodic) in which:

- the biological, hydrological and geomorphological processes associated with river flow; and
- the biological, hydrological and geomorphological processes in those parts of the catchment, with which the river is intimately linked, have not been significantly altered since European settlement.

Like India, many of Australia's river systems received a ravaging during the process of colonisation and the development of modern Australia. Most of its river systems today are severely degraded due to over-extraction, pollution, catchment modification and river regulation (Dunn 2000, Arthington and Pussey 2003, Kingsford et al 2005).

Background: The seeds of the Wild Rivers Campaign and the subsequent Act were sown during the Franklin River campaign, led by The Tasmanian Wilderness Society in 1970s. With intense and tireless efforts, a huge hydropower dam on the unique Franklin River in Tasmania was stopped. Through the Wilderness

Society, efforts for protecting the remaining untouched rivers went on.

In 1992, the *Wild Rivers Act* was passed. The main responsibility of managing Wild Rivers lay with the Australian Heritage Commission, overseeing the project was the *Wild Rivers Committee*, which included representatives from the Commonwealth, State and Territory governments, local government, landowners (including the National Farmers Federation), conservation groups, Indigenous people and the scientific community.

The Australian Heritage Commission completed the *Wild Rivers Project* in 1998, which culminated in the reports *The Identification of Wild Rivers* and *Conservation Guidelines for the Management of Wild River Values* (Department of the Environment and Heritage, Australia. 1998a and 1998b). These reports later formed the basis for the Queensland *Wild Rivers Act 2005*.

Wild River Criteria Wild Rivers is defined as a stream that has all, or almost all, of its natural values intact. This does not necessarily mean that the river is in pristine condition, but rather that **it remains largely unaffected by development in its catchment area**. The Department of Environment and Resource Management has identified the following elements that are necessary to constitute a wild river:

- * Hydrology - the rivers are **free flowing** and well connected to their floodplains and shallow aquifers.
- * Geomorphology - the bed and bank are stable with a natural movement of sediment along the river to estuaries and floodplains.
- * Water quality - sufficient to meet human and ecological needs.
- * Riparian vegetation - sufficient trees, shrubs and sedges to protect banks and provide food for fauna.
- * Wildlife corridors - natural habitat along rivers to allow native animals to migrate within their natural ranges.

Like in India, water is a State subject in Australia and each state has the right to manage its Wild Rivers in whichever way it deems fit.

In some Australian states like Queensland, when the state government sought to reform water management by passing the *Water Act 2000*, **conservation groups strongly advocated for parallel discrete legislation to protect the conservation values of rivers, including free flowing rivers. This was in recognition that the Water Act focused on water allocation and use but did not specifically address environmental protection issues, nor provide a sensible and effective regulatory framework to protect Queensland's remaining free flowing rivers.**

Looking at the ecological assessment of rivers in India, we can safely conclude that ecological goods and services of most of the rivers are not yet quantified, and it will indeed be an irreparable loss to lose these services through short sighted management decisions.

How the Legislation works In order to give clear definition for this assessment process, a declared Wild River Area (defined by a river basin) is spatially mapped into different management areas, which have varying rules to guide development activities in the *Wild Rivers Code*.

The management areas include:

- **High Preservation Area:** the buffer zone around the main watercourses and wetlands where ecologically destructive development like dams, irrigated agriculture and strip mining is prohibited. Lower-impact activities, such as grazing, infrastructure such as houses, and fishing are allowed.
- **Preservation Area:** the remainder of the basin, where most development activity can occur as long as it meets requirements that minimise the impacts on the river system.
- **Floodplain Management Area:** important floodplain areas in the basin, where the construction of levees and other flow-impeding development is regulated to protect the connectivity between this area and the main river channels.
- **Sub-artesian Management Area:** areas where there is an underlying aquifer that is strongly connected to the river system. Water extraction from this area needs to be considered in the overall water allocation for the basin.
- **Designated Urban Area:** areas where there is a town or village, so certain types of development are exempt from the *Wild Rivers Code*.
- **Nominated Waterways:** secondary tributaries or streams in the Preservation Area where certain development set-backs apply.

In practice this means that **destructive developments like large dams, intensive irrigation, and mining cannot occur in sensitive riverine and wetland environments** (in the High Preservation Area), while a range of other developments have to meet sensible requirements outlined by the *Wild Rivers Code*.

A Wild River declaration cannot occur without extensive community consultation, including a public submission phase. The formal consultation process is triggered when the Government releases a draft declaration proposal (termed a "nomination"). This includes releasing a draft map showing proposed management areas, and is followed by months of face-to-face meetings between the Government and communities, sectoral groups, and industry organisations, as well as a chance for people to lodge submissions with the Govt.

NATIONAL RIVERS, SWEDEN

According to the Swedish Ecologist Christer Nilsson, one of the pioneering champions of free flowing rivers, environmental movement to protect the country's last

four major rivers from dams began in the late sixties, following the damming of Sweden's majority of rivers. This was the first major environmental battle in Sweden. In April 1970 the government decided to prohibit the planned development on one of the four rivers.

The environmental movement was discussing the importance of free flowing rivers scientifically for the first time. The Swedish Govt protected these four rivers as National Rivers and a few smaller ones through various measures like National Parks, Protected areas, etc. Presently the major rivers Kalix, Torne and two other rivers are national rivers, protected from any planned development.

Conclusion Looking at the immense use and non use values of free flowing rivers, the need to protect these (few) rivers is very real and urgent. Although the countries listed here which have worked on legislation/institutions to maintain free flowing rivers are developed, developing countries like ours have important lessons to learn from this as we depend more heavily and directly on our natural resources. The rural poor and the marginalised are the biggest losers when we lose this natural capital. When climate change has become an irrevocable fact and the futures of peninsular and Himalayan Rivers look disturbing, conservation of natural resources, especially free flowing rivers becomes even more critical.

Without getting entangled in trying to exactly define a free flowing river (as most of the rivers, if not the feeder streams, have been impounded through small scale structures, which impound a miniscule quantity of water, compared to large dams), we can assume that rivers whose water flow and sediment flow is not strongly affected by dams, which have not been embanked or channelized, which have good riparian health and water quality and which support important biodiversity and community services should be protected for the benefit of current and future generations. These rivers will provide an engaging outdoor laboratory for young minds of tomorrow, who may not see a natural river at all. Like river Gundia in Western Ghats, which is now threatened with hydropower dams, these rivers will provide the last haven for dwindling aquatic, riparian and avian biodiversity and may nurture a thriving forest ecosystem.

Looking at the ecological assessment of rivers in India, we can safely conclude that ecological goods and services of the rivers are not yet quantified. It will indeed be an irreparable loss to lose these services through short sighted management decisions.

At the same time, even in the case of dammed rivers, there are stretches which are of unique ecological/ social/ cultural value, which should be protected. For example, stretches of rivers like Chalakudy, Jia Boroli, Ramganga, Kabini, etc. which support immensely rich fisheries as well as avian biodiversity, Stretches of rivers like Namada, Ganga, Krishna, Godavari which are of high cultural/ spiritual importance. These stretches should receive special protection through measures like Ecological Sensitive Areas, National Parks, Conservation areas, etc.

At the very least, rivers representing each ecological class like Himalayan, desert rivers, peninsular rivers from eastern and Western Ghats, etc., need to be conserved and ecologically/socially important stretches in all the large rivers should be identified and protected.

All in all, looking at the dismal performance of Union and state water resources ministries, Union and State Ministries of Environment and Forests, Central and State Pollution Control Boards, Fisheries Departments, Action Plans like Ganga, Yamuna and other River Action Plans which result in NO change in the status of river, Parliament, judiciary, media and other arms of our "democracy", it is high time that we learn our lessons: **River Conservation is better than restoration and prioritise protection of free flowing rivers.**

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Is there a case for Renuka Dam?

A large number of individuals and organizations from Delhi on June 30, 2010 wrote a letter to Delhi Chief Minister, Lt Governor of Delhi, Delhi Jal Board CEO, Himachal Pradesh Chief Minister, Chairman of Himachal Pradesh Power Corporation Limited, Union Ministers of Environment & Forests, Union Minister of Water Resources and also Planning Commission member in charge of water resources, besides UPA chairperson Smt Sonia Gandhi. The letter questioned the need, desirability and viability of the proposed Renuka dam, meant basically for Delhi's water supply. The signatories included Shri Ramaswamy Iyer, Paritosh Tyagi, Manoj Mishra, Rajendra Singh, Dr. Vandana Shiva, Prof Amrita Baviskar, among many others. The full text and list of signatories can be found at www.sandrp.in. Here we are giving main text of the letter. Except an acknowledgement from the office of Delhi Chief Minister, there has been no response from any one to whom the letter has been sent.

The Delhi govt has been promoting and funding the controversial 148 m high Renuka Dam in Sirmour District of Himachal Pradesh. This dam on river Giri, a tributary of Yamuna River is basically meant to supply water to Delhi. The Rs 3900 crores (2006 price line) project is to be funded with 90% of the money coming from the Centre. In fact the Delhi govt has already paid the Himachal Pradesh Power Corp Limited Rs 215 crore for land acquisition and displacement related to this Renuka dam from which Delhi hopes to get 23 cubic meters per second water for nine post-monsoon months. We the citizens and groups of Delhi (some of us recently visited the valley) after study of the project and Delhi's water situation would like to raise the following points:

1. Avoidable losses According to a number of studies, including a recent ASSOCHAM⁴ study and also the statements of Delhi Jal Board, water losses in Delhi during transmission and distribution are 35-40%, which should be no more than 10-15% even by developing country standards. 23% of the water supply connections remain unmetered. Most of the bulk water meters of the DJB have not been functioning for many years, so a disintegrated analysis as to where these losses are going is not possible. This state of affairs has been known to exist for over a decade, but there is no change in this state of affairs. Why is the DJB not able to install functioning bulk water meters at various inlets, including upto the colony level inlets? Why is the DJB not able to reduce the losses? If Delhi could reduce the losses from 40% to technically feasible 10%, the water saved would be almost the same quantity that Delhi hopes to get from the proposed Renuka dam at far less costs and impacts.

Similarly, why is Delhi not taking other possible demand side management options to discourage avoidable misuse of water? Here it is equally important to note that Delhi has been using its current water supply in a most inequitable way. While the vast majority of the population struggles to get water for their daily basic needs, there are islands that use water most wastefully. This is the known state of affairs for many years and Delhi govt has achieved precious little improvement in this situation. Sooner, rather than later, we need to realize that Delhi cannot keep demanding more water for itself from far-off places when there are competing and justifiable demands on that water from local people.



2. Non-essential activities

Delhi is basically dependent on water imported from long distances. Despite this a lot of avoidable water-intensive non essential activities are allowed to continue in Delhi, including licensed and other water bottling plants (including by the DJB and Railways), golf courses, water parks and so on. How can Delhi justify demands for more water from long distances when such non-essential water guzzling activities are allowed to go on here?

3. Rainwater harvesting Even as lip service is being paid and massive amounts spent ritualistically every year in advertisements, why there is so little progress on the ground in achieving Rain Water Harvesting (RWH) in Delhi? What proportion of Govt (Centre, State and city government) buildings, embassies, commercial buildings, offices, malls, multiplexes, colleges, schools, institutional buildings, road surfaces, flyovers, parks and such other open spaces have installed RWH systems? Why should they all not be given say a two-year time limit to achieve this, failure in the end inviting punitive

⁴ <http://beta.thehindu.com/news/cities/Delhi/article76718eccc>, accessed on June 23, 2010

measures⁵? Without achieving such measures, can Delhi justify demanding more water from outside? Should not Delhi be protecting its local water systems of tanks, baolis, lakes and so on before it starts looking for additional water from far-off regions? Why is Delhi allowing the local water systems to be systematically destroyed year after year? The recent incident at Muradnagar is one of series of such incidents in the past where upstream demands have held Delhi's water use hostage. Such incidents underscore the need for Delhi to manage its water within limits that depend largely on local sources of water including rainwater harvests.

4. Groundwater over use and recharge It is well known that Delhi uses (as in 2004, it would have increased thereafter) about 480 Million Cubic Meters of Groundwater per annum, which is about 170% of annual recharge potential amounting to 280 MCM. The actual recharge potential is likely to be less than this considering the rapid pace at which we are destroying local water bodies, the Ridge, the floodplain and other recharge systems. However, considering the floodplains, Ridge and an extensive concrete built up area, there is huge unexplored recharge potential and Delhi govt is taking very little effective action to achieve that potential. Is there any justification for Delhi demanding additional water from far-off sources before it realizes this huge potential, which may actually provide greater storage space in underground aquifers than proposed dams like Renuka may provide?

5. Wastewater treatment and Recycle Delhi is currently producing at least 800 MGD of wastewater (DJB claims to supply 800 MGD plus additional local groundwater use of at least 200 MGD, thus total water use of 1000 MGD, as per standard assumption, 80% would be returning as sewage). But the Design capacity of Delhi's Sewage Treatment Plants (STP) is about 520 MGD, actual treatment happening is closer to 380 MGD. This means that *by design* Delhi does not have capacity to treat the sewage it generates and untreated sewage is by design, destined to be dumped in the Yamuna River, in complete violation of the Water Pollution Control Act of 1974. If Delhi gets more freshwater, it will generate more sewage, worsening the situation of Yamuna River in Delhi and downstream. This will be in violation of the law and the declared objective of the Prime Minister-headed National Ganga River Basin Authority. Should not Delhi be expected to install adequate capacity of operating STPs in Delhi for the current and future sewage that Delhi will generate? Should not all the industries, hotels, office complexes, malls, multiplexes and such units be asked to install functional STPs in their premises and recycle part of treated water in their units in say next two years, punitive measures kicking in if they fail to achieve that at the end of that term? Why should the hundreds of

parks in Delhi continue to be irrigated with freshwater? Why should Delhi be demanding more freshwater from outside without achieving all this?

6. Issues related to environmental and social costs/destruction due to Renuka Dam Delhi seems to have got used to demanding water from far-off sources. Some of the sources that Delhi has used up in the process in the past include: Bhakra Dam (Sutlej River), Hathnikund barrage and Western Yamuna Canal (Yamuna River), Ramganga Dam (Ramganga River), Tehri Dam (Bhagirathi – Ganga River). The huge displacements and environmental destruction that these projects have created are fresh in people's minds and the number of sufferers keeps going up, they getting no benefits, only the costs. What right Delhi has to demand more of such displacement and destruction?

Now Delhi is saying that it wants to *purchase* more water and it claims that Himachal is the next *willing seller*⁶ through the building of Renuka Dam. The trouble is, that the reality is quite complex and this attitude of Delhi rulers as buyers of water from such far off dams without bothering about the consequences thereof would be pretty shocking, if true. Renuka dam with live storage capacity of 498 MCM will displace at least 6000 people from 34 villages, submerge about 1600 ha of land, mostly very fertile land or dense biodiversity rich forest, implying uprooting of several lakh trees, thus destroying a huge carbon sink and implying huge climate change impact (in complete violation of the declared aim of the National Action Plan on Climate Change and National Green Mission), destruction of the river and so on. Briefly, it will create immense destruction which seems completely avoidable. There are many other related issues, including that of lack of legal memorandum of agreement, demand from the upper Yamuna basin states (Haryana, UP, Rajasthan) for share in benefits, the huge economic cost, the serious impact of the project on existing downstream hydropower project and other use of the river, inadequate EIA, public consultation and so on. In short, we do not think there is any case for Delhi to demand and facilitate building of Renuka dam for its use.

Under the circumstances, we do not think there is any justification in Delhi's demand for this dam. We urge you kindly give this issue serious thought and review Delhi government's position on the same. Delhi must give a lead to the entire country in managing its water within available limits rather than plan on poaching water from far flung areas, which provides the city dwellers with a false sense of unlimited and plentiful supplies, just because Delhi happens to be the nation's capital. Let Delhi under your stewardship set a shining example for other cities in the country to follow by withdrawing from the Dam project on river Giri at Renuka ji.

⁵ In the past notifications and deadlines have been issued, but there was neither the declaration of consequences when these nor implemented, nor the will to implement them.

⁶ The phrases used by Delhi Chief Minister Smt Sheila Dixit when a delegation met her on July 23, 2009 on the issue of Renuka Dam.

A village at the mercy of the Bagmati and Bihar government

Dr Dinesh Kumar Mishra

Rampur Kanth, with only 90 families, was a small village located on the right bank of the Bagmati River in Bairgania block of Sitamarhi district of Bihar in early 1970s. In order to protect some areas against flooding, the Bagmati was embanked in then in its upper reaches and the village got trapped within two embankments of the river and had to be relocated in the protected countryside of the eastern embankment.

The river came very close to the embankment in July 2007 and only a sand wall in the shape of embankment separated the Rampur Kanth from the river. This sent shock waves to the residents of the Rampur Kanth rehabilitation site as the embankment could slump down any moment and the village would get washed away.

The village has 259 families according to the census report (2001) with a population of 1,009. Reorganisation of blocks brought Rampur Kanth into the Suppi block of the same district. Relocation meant that any displaced family would get a small plot of land for building a house and a shifting allowance of Rs 300 per family for the kind of houses that Rampur Kanth used to have. No help was given by the state to build the houses.

The displaced persons were also entitled for some common land for roads, schools etc and a hand pump for drinking water. All its agricultural land was located within the embankments which the oustees were supposed to till and continues to be at the mercy of the river.

The village is now located on the left bank of the river and all the families are crammed in a plot of 16.86 acres. It took about 3-4 years to get the favour of allocation of land and the displaced people had to live on the under construction embankment during period.

Part land of the village was lost to the alignment of the embankment, rehabilitation site and the remaining portion was consigned to the river flowing within the embankments which started gnawing it slowly and that forced the youth of the village to seek employment in greener pastures of Punjab and Delhi as the local employment came to standstill. At the moment, all the working hands of the village have migrated elsewhere in search of employment.

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rehabilitation site as the embankment could slump down any moment and the village would get washed away.

On July 29, the residents of the village informed the chief minister, minister for water resources and the flood control room about the impending disaster and repeated their request to the collector of the district on the July 31 for immediate action and copied the message to all other concerned officials and ministers.

Only ADM of the district responded and wrote to the divisional executive engineer to save the people and report back to him of the action taken. No action was taken and the embankment gave way at 2100 hrs on Aug 18, '07, exactly one year before the infamous breach of the Kosi embankment at Kusaha in 2008.

Most of the houses were swept away and almost all the residents of the village had to shift to the remaining portion of the embankment in makeshift hutments made of bamboo, leaves, straw, polythene sheets etc.

The collector visited the site on August 20 and issued some instructions to the concerned officials who were now busy digging earth from the heel and toe of the embankment and trying to plug the breach. Thinking that the exercise was a futile attempt to plug the breach, the villagers wrote to the chief minister and the concerned officials for help with no response from anywhere.

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Those camping on the embankment did not know till then that the river has not only swept away their dwellings but has also converted their rehabilitation site into a ditch over which no construction was possible unless the ditch was filled up with earth that was nowhere in sight as floodwater was

everywhere. They approached engineers & officials on Sept 7, '07 but by now the officials had got used to listening to such woes.

The situations had changed with the outset of winter and so did the charter of demands by the victims. They wanted the ditch to be filled, compensation for the loss of property, monetary help for building houses and action against the guilty officials and their suspension. It is

reported that grant for constructing houses for 134 families reached Sitamarhi but the *mukhia* of the village started demanding Rs 5,000 per family as bribe so that the grant could be advanced to the victims.

The villagers refused to pay him and he modified the beneficiary's list to 185 to include his men in it. The govt smelt a rat and withdrew the grant. The flood victims wrote to the CM, minister for disaster management, commissioner, and the district collector to do something for them. That was Dec 15, '08 and over a year had passed since the breach had occurred.

The govt smelt a rat and withdrew the grant. The flood victims wrote to the CM, minister for disaster management, commissioner, and the district collector to do something for them. That was Dec 15, '08 and over a year had passed since the breach had occurred... The site remains unfit for house construction even now and all the 134 residents are still camping on the embankment in their huts.

This prayer induced the administration to ensure that the eroded land is filled with earth to facilitate house building. The contractor, however, did not find the job rewarding and left it half done although he turned the remaining portion of land up side down. The site remains unfit for house construction and all the 134 residents are still camping on the embankment in their huts.

The state government is raising, strengthening and extending the Bagmati embankments at an estimated cost of Rs 792 crore and this work is being done all over except Rampur Kanth where no work has been done because the people are camping over there and refuse to shift elsewhere unless their demands are met. They are still demanding filling of their land and some grant to build their houses.

In the meanwhile, there was a *janata darbar* of the chief minister at Raghapur Bakhari village in Dumra block of Sitamarhi on Jan 24, '10 and the residents of Rampur Kanth went there to give a representation to the CM. It is reported that the chief minister had assured these villagers that their problems would be solved soon.

Yet, nothing happened and the villagers once again approached the collector of Sitamarhi on the Feb 2, '10

requesting him, to complete the half done work of filling of the homestead land and that all the 134 families be given housing grants under Indira Awas Yojana to compensate for the losses incurred due to breach in the embankment in 2007. When this was reported in a local daily through my article, the CM denied he made any

In the meanwhile, there was a *janata darbar* of the chief minister Nitish Kumar at Raghapur Bakhari village in Dumra block of Sitamarhi on Jan 24, '10 and the residents of Rampur Kanth went there to give a representation to the CM. It is reported that the chief minister had assured these villagers that their problems would be solved soon. Yet, nothing happened. When this was reported in a local daily through my article, the CM denied he made any promises but the proof of his promises exists. Leaving the issue of promises aside, what is stopping CM to taking necessary action?

promises but the proof of his promises exists. Leaving the issue of promises aside, what is stopping CM to taking necessary action?

That was the progress made after toil of over two and a half years' knocking at every door, from the local mukhia

to prime minister of the country. They have come back to the same situation that the river had put them in on the night of August 18, 2007 braving rains, cold and heat waves ever since. Sand that blows with summer winds tests their patience and the government feels contended that the people are equipped to boldly face any problem, be it forthcoming rains or the chill

winter for the past three years.

It also might be thinking that once 90 families were rehabilitated when the embankments were built in 1970s, there was no point in rehabilitating 134 families once again as that was going to be an endless process because the embankments would keep on breaching and such demands would keep coming in.

Rampur Kanth should not become an example for the others to make such demands and it might be trying to nip the bud in the beginning. It is worth noting that the Bagmati embankments have breached 43 times during 1997-2009 period according to official sources.

Had the flood victims known that the embankment might breach in future rendering them homeless with nobody

to look after them, they would never have accepted rehabilitation. Had they known that the government knows only how to build the embankments but not to maintain them, they might not have accepted relocation.

They would also not have come to rehabilitation sites if they had known that all the concerned officials would shrug off their responsibility to the people once a calamity like the one of 2007 strikes them. They are

scared that the river might sweep the remaining portion of the embankment anytime and there is none in the administration to take cognisance of the imminent danger they will be faced with.

Will someone listen to the woes of the people of Rampur Kanth?

CLIMATE CHANGE & WATER SECTOR**Artificial Glaciers to Survive Global Warming**

As glaciers disappear in the rain shadow of the Himalayas, one man is helping farmers irrigate their fields by storing water in an innovative way.

The village of Stakmo is reached by a dusty road that winds through the barren Ladakhi landscape. The slopes surrounding the village were cloaked with three glaciers 30 years ago, but villagers say that over the past decade the glaciers have vanished, leaving nothing but bare rock. Without water, the villagers' crops have failed. The snow line here has risen 150 meters, and glaciers have retreated by 10 kms.

Retired local engineer Chewang Norphel has been working on a method to create artificial glaciers. He approached the villagers at Stakmo and offered his help. Norphel began by constructing stone walls in the slopes above the village to divert the runoff from winter precipitation into an area that is shaded from the sun during winter and spring by the mountain. A series of embankments slowed the freezing water for long enough that it could build up into an artificial glacier.

Villagers helped Norphel to build retaining walls for a storage reservoir that would act as a second glacier, fed by excess runoff from the primary glacier higher up the slope. During winter, the glacier formed as planned, storing water that would otherwise have flowed away past the village of Stakmo.

During the crucial sowing season, the artificial glacier began melting, releasing much-needed water to the villagers. Carefully constructed irrigation channels were built by Stakmo villagers under Norphel's guidance. Previously barren fields in Stakmo were turned green by the stored water from the artificial glacier. Harvests increased threefold in Stakmo, and villagers began planting more than one crop per year.

"We have so much wheat yield now that we are even selling some," says Tashi Angmo, who lives in Stakmo. "People who moved away are starting to return to the village because there is hope now." Thanks to Norphel's man-made glacier, the villagers now have enough grass to store for their animals. It means that they no longer have to let herds in search of grazing patches roam far into the mountains, where they are easy prey for snow leopards and wolves.

Norphel is continually improving his design, adding more glaciers higher up and near different villages. "Water is the most important thing we have. Without water, we have no food; no life," he says. Around 10,000 people now benefit from his 10 glaciers, but he knows that his technology provides just a temporary respite. "Even artificial glaciers won't freeze if it gets too warm," he warns. (scientificamerican.com 240510)

Water Mission cleared by PM's council: Promises all water data in public domain: MWR says NO The Prime Minister's Council on Climate Change on May 28, 2010 approved *in principle* the National Water Mission and suggested that "its basic approach should be to make water conservation a peoples' movement in India. For this it is essential to make available all data on water in the public domain to be able to mobilise citizens, local and State Governments for focused action on water conservation and augmentation", as stated in the Government press released of that day. The Prime Minister chairing the Council said that political leadership at the local body level, state level and civil society organizations need to be involved in activities of the Water Mission. It was stated that the first step in this direction would be to prepare a comprehensive water data base in the public domain and assessing the impact of climate change on water. It was also decided that water use efficiency should be raised by 20%. (PIB 280510, other sources)

Contradicting these intentions, the process of formulating the NWM was completely non transparent and no participatory even though many including SANDRP had written to the Ministry of Water Resources in early 2009, over 14 months ago suggesting such an approach. The SANDRP's critique of the National Action Plan, including the Water Mission, was sent to all the members of the PM's council on water mission and all the members of the various committees constituted for the water mission. No one from the ministry even bothered to acknowledge receipt of the critique, leave aside the question of responding to the issues raised therein. The draft action plan was put up on the Ministry of Water Resources website for over 14 months, but no attempt was made to translate the mission document into hindi and other local languages, disseminate it or seek wider views and suggestions on the mission.

The government's press release says "it is essential to make available all data on water in the public domain", but a week after that press release, at a hearing before the Central Information Commission, the Union Ministry of Water Resources refused to share the report, minutes and agenda notes of meeting on large hydropower projects in the North East India. It is clear that Union Ministry of Water Resources have rather far to go before it can start making claims about sharing information in public domain.

Green India Mission misses crucial lessons The National Mission for a Green India, or Green India Mission, one of the eight missions announced under the National Action Plan on Climate Change, acknowledges the "influence that the forestry sector has on environmental amelioration through climate mitigation, food security, water security, biodiversity conservation and livelihood security of forest-dependent communities". One of three basic objectives of the mission includes, "Enhance the functions and resilience

of ecosystems, including increased water infiltration, groundwater recharge, stream and spring flows, biodiversity values and forest benefits (fuel wood, fodder, timber and non-timber forest produce, among other things) to local communities." The mission document makes many promises but does not spell out how they will be achieved. One of its biggest weaknesses is the complete absence of a strategy to prevent the loss of standing forests. While the MoEF formulates greening programmes, the Government of India is busy de-greening India. Between 1999 and 2007, about 50,000 ha of forest land, some of it with good standing forests was diverted annually to non-forest use. Communities have been involved in various plantation and protection activities but the decision-making has not been shared, and often the promised benefits have not reached the people, resulting in low stakes and sustainability. A Joint statement from forest movements clearly concluded: "This Mission, in its current form, will lead to increased land grabbing, violation of people's rights, environmental destruction, and loss of common lands and livelihoods based on them, without in any way genuinely responding to the burning problem of climate change." (Joint statement from forest movements 200710, Frontline 300710)

Orissa climate plan eyewash: NGOs Terming the extended date for receiving public comments and suggestions by one month as not sufficient, the Orissa NGOs has urged the Govt. of Orissa to make the Draft Orissa Climate Change Action Plan available in Oriya to all sections of the society; organize consultations in each district, give three months for people to respond and disclose the loan burden the plan will bring to the state and its people. The organisations also expressed concern about the role of World Bank and the United Kingdom's Department for International Development in preparation of the draft and how these institutes' involvement in climate change plans worldwide is vested with business interest. (Water Initiatives Orissa, Focus Odisha Forum, Pioneer 280610)

HP: ADB report on climate adaptation water strategy Chief Secretary of Himachal Pradesh has released Asian Development Bank report on "Climate Change Adaptation Water Resources Strategy for Himachal Pradesh". She said that this study has been done by Asian Development Bank under technical cooperation programme with the Department of Agriculture, Himachal Pradesh which started in September, 2009. The report is supposed to help in Planning & Management of Water Resources for the State in view of climate change. The strategy examines the present institutional arrangements for water resources management and assesses the requirement for institutional development, strengthening and necessary reform measures to support the development of sustainable water resource management. It was revealed that Analysis of temperature trends in the Himalayas and vicinities shows that temperature

increases are greater in the uplands than the lowlands. (indiaeducationary.in 250610) It is noteworthy, however, that the ADB is involved in funding large hydropower projects in Himachal Pradesh, which are actually destroying the water resources and also accelerating the climate change impacts with destruction of forests, rivers and other natural resources. Credibility of ADB efforts on climate change, under the circumstances, will remain suspect.

15% Sunderbans may submerge by 2020: Report With rising sea level, about 15 per cent of the Sunderbans islands is likely to be submerged by 2020, thereby leaving 70,000 islanders stranded as environmental refugees, says a state human development report on South 24 Parganas district. Prepared by the Development and Planning department with technical support of United Nations Development Programme, the report warns that neglecting the Sunderbans Delta can have significant implications on global climate. (Indian Express 140710)

2009 drought in Kenya due to Climate Change: GTZ "The 2000-2009 decade, the warmest on record, led to significant climate anomalies. As always, it is the poor that have been hardest hit. The 2009 drought in Kenya, for example, was responsible for the loss of over 150,000 head of livestock and a 40% drop in maize harvests, leading to massive food shortages, affecting some 23 million people." However, the government of India made no attempt to link its 2009 monsoon failure to climate change. (GTZ newsletter *Adapt to climate change* July 2010)

SRI: SAVES WATER, INCREASES OUTPUT

8.5 Lakh Ha under SRI in Tamil Nadu Despite a good monsoon in Tamil Nadu in 2010, areas under cultivation have not received enough rainfall. However, the state government has assured that foodgrains production in kharif would touch 11.2 million tonnes, including 8.5 million tonnes rice and 2.3 million tonnes pulses. S Kosalraman, commissioner of agriculture, Tamil Nadu government, said the government had introduced system rice intensification (SRI) to overcome the water shortage and maximise production. The area under SRI had been increased from 2,000 hectares to 0.6 million hectares last year. This year, it would be increased to 0.85 million hectares. K Nanda Kishore, secretary in the agriculture department, said rice production has increased from 23.66 million tonnes in 2001-05 to 24 million tonnes in 2006-09. Food grain production has gone up from 28.7 million tonnes in 2001-05 to 31.89 million tonnes in 2006-09. (Business Standard 300710)

NABARD to promote SRI in AP National Bank for Agriculture and Rural Development will rope in about one lakh farmers of Andhra Pradesh this year to promote System of Rice Intensification method. "We are going to appoint NGOs to help farmers in the rain-fed areas,"

Chief General Manager of NABARD (AP) said. (Indian Express 120710)

SRI to help Bengal cut water consumption At a time when productivity is dwindling in West Bengal, farmers are trying out a new method, Systemic Rice Intensification, to increase productivity. The new method uses 40% less water and has helped increase production by 20% in some blocks of the state. "We have seen a very good response in West Bengal. Farmers have already accepted the new method of cultivation," said Sanjiv Chopra, joint secretary, Union agriculture ministry. According to agriculture department officials, farmers in almost all blocks in North Bengal have adopted the new technique after initial resistance.

"Although farmers are using the method during Boro cropping season, we are also trying to popularise SRI method in up-land districts like Purulia, Bankura, Paschim Medinipur, Birbhum and Burdwan during the Kharif season," Subir Choudhury, consultant of RKVY said. W Bengal, which has almost 15 lakh hectares under Boro rice cultivation, has resorted to the new cropping pattern in 2008, starting on pilot basis. "The farmers have now seen the benefits of the new method. Apart from low water requirement, fertiliser cost and requirement of pumpsets has also come down," Choudhury said. "While the productivity was around 4 tonne per hectare in the normal mode of cultivation, it went up to 4.5-4.6 tonne after farmers resorted to SRI method," he added. (Financial Express 030710)

GROUNDWATER

Groundwater depletion The proportion of the unsafe districts (semi-critical, critical and overexploited) has gone up from 9% in 1995 to 31% in 2004 (the latest data for which is available). The population affected has gone up from 7% to 35% and area affected has gone up from 5% to 33%. India is currently using 634 BCM water in all annually, including 210 BCM of groundwater and 424 BCM of surface water (but these figures look out dated / suspect).

11th Plan Mid Term Appraisal supports SANDRP conclusions The Mid Term Appraisal of the 11th Five year Plan prepared by the Planning Commission and approved by the National Development Council on July 24, 2010, supports SANDRP conclusions when it says in para 21.7, "...use of water in India is characterised by an increasing dependence on groundwater for irrigation. The annual extraction of groundwater in India (210 billion cubic metres) is by far the highest in the world. ...groundwater today provides more than 60 per cent of net irrigated area. It accounted for over 85 per cent of the addition to irrigated area in the last 30 years. The area irrigated by canals and tanks has actually undergone a decline even in absolute terms since the 1990s." This was exactly the conclusion of the SANDRP analysis in May 2010 (see http://www.sandrp.in/irrigation/Failure_of_Big_Irrigation_Projects_and

[Rainfed Agriculture 0510.pdf](#)) and earlier in October 2007 reached exactly this conclusions, that area irrigated by major and medium irrigation projects have seen decline in absolute terms since 1991-92. (Mid Term Appraisal of 11th Five Year Plan)

INTER LINKING OF RIVERS

Planning Commission Critical of ILR The Mid Term Appraisal of the 11th Five Year Plan, approved by the National Development Council on July 24, 2010 is very critical of the ILR plans. It says: "The current proposal to link Himalayan with the Peninsular Rivers for inter-basin transfer of water is estimated to cost around Rs. 5,60,000 crores. Land submergence and R&R packages would be additional to this cost. There are no firm estimates available for running costs of the scheme, such as the cost of power required to lift water."

"Several technical problems have to be addressed in order to inter-link and become economical. In a country like India which gets seasonal rainfall from monsoons, the periods when rivers have "surplus" water are generally synchronous across the subcontinent. Another key issue is how the reasonable needs of the basin states, which will grow over time, will be taken into account while planning inter-basin transfers. Further, given the topography of India and the way links are envisaged, it might totally bypass the core dryland areas of Central and Western India, which are located on elevations of 300+ metres above MSL. It is also feared that linking rivers could affect the natural supply of nutrients through curtailing flooding of the downstream areas. Along the east coast of India, all major peninsular rivers have extensive deltas. Damming the rivers for linking will cut down the sediment supply and cause coastal and delta erosion, destroying the fragile coastal eco-systems. It is also pointed out that the scheme could affect the monsoon system significantly. The presence of a low salinity layer of water with low density is a reason for maintenance of high sea-surface temperatures (greater than 28 degrees C) in the Bay of Bengal, creating low pressure areas and intensification of monsoon activity. Rainfall over much of the subcontinent is controlled by this layer of low saline water. A disruption in this layer could have serious long-term consequences for climate and rainfall in the subcontinent, endangering the livelihoods of a vast population." Its conclusion, though is not in line with the above analysis and is rather mild, almost status quo-ist, "It is, therefore, necessary to move forward on this proposal with due diligence." (Mid Term Appraisal of 11th Five Year Plan, July 2010)

Opposition to Par-Tapi-Narmada Link Once again the primarily Adivasi communities in Southern Gujarat risk displacement to make up for alleged water shortfalls in the northern part of the state. The Chief Ministers of Gujarat and Maharashtra, along with the Prime Minister have signed a memorandum of understanding to move forward with the Par-Tapi-Narmada (& Damanganga

Pinjal) link project aiming to connect the water of west flowing rivers from Par to Narmada – diverting “surplus” water from southern Gujarat to northern Gujarat through a 395 km canal link.

Six of the proposed seven dams are along the Eastern Adivasi belt of Gujarat, while one is on the Maharashtra side (Nashik district) of the border. The resulting reservoirs will submerge either wholly or partly at least 24 villages, and 7,559 ha land, including 3,572 ha of forest land, according to revised 2004-2005 feasibility report. Some 15 000 to 20 000 people are likely to be affected. Roughly 78% of the area for irrigation will fall under the Sardar Sarovar project in the Narmada command and yet the feasibility report has no details as to how the water thus becoming surplus in SSP will be used. One of the proposed dams is located on the Nar River near Paikhed village, which will swallow up Chikhalpada village in Dharampur block.

In Chikhalpada, around 1200 Adivasi farmers from 21 villages gathered on 7 July 2010 for a first public assembly to speak out against the project. The local community only got a whiff when surveyors came around taking soil samples – but it has received no official information regarding the link or its consequences. Such details are already available on the internet in the English language, far away from the local residents. And in fact, despite the MoU and updated feasibility reports, many local residents were verbally assured by project surveyors that no link will be built or that the link will not affect villages that indeed fall within the slated submergence zone.

The community verdict is clear: they want no dam. They are not interested in resettling anywhere. To demonstrate their opposition, the people of nearby Mohankachali would not allow the government to conduct a survey for a dam proposed on the Par River. Maharashtra farmers also expressed solidarity at the July 7 meeting, and called for a public assembly on the Maharashtra side. All those present signed a memorandum to be submitted to the district collector demanding basic information on this project.

Community selected leaders from each village later met to form the Par-Nar Adivasi Sangathan, a banner under which they will raise opposition against the link project and accompanying dams. Paryavaran Suraksha Samiti and National Alliance of People's Movements, Gujarat members pledged full support to the villagers' campaign. The purported benefits of this project hang by a thread, even by the numbers of the project proponents. The estimates of the number of those displaced, the Rs. 6,000+ crore budget, and water needs in the “surplus” regions will continue to inflate as time passes. It must be pointed out that Dharampur taluka despite receiving over 2000 mm rain faces serious water scarcity in summer months. In less than a decade, since the link's conception in 1995, the water scenario of South Gujarat

changed so drastically that the Ukai reservoir had to be dropped from the project due to the lack of surplus water. (Paryavaran Suraksha Samiti, Gujarat)

DAMS

Renuka Dam: Opposition intensifies Delhi government *now* realises that at least 15% of the water released from the proposed Renuka dam for Delhi will be lost on the way through evaporation over the 300 km long canal. (Asian Age 190510, SANDRP)

CIC raps MWR on Pong dam oustee's plea The Central Information Commission has directed the Ministry of Water Resources to reply to the queries of Pong Dam oustee Ashwani Kumar Awasthi in three weeks. Awasthi, general secretary of the Pong Dam Visthapit Sangarsh Committee, said that he had been seeking information under the RTI Act from the Ministry of Water Resources regarding action taken on the Supreme Court's 1996 order — the apex court had ordered the Ministry to get 1,100 ha land in Sri Ganganagar district transferred in the name of Pong Dam oustees. However, till date the land has not been allotted to the oustees. “To evade the query, Ministry officials used to transfer my application to either the Rajasthan Government or the Relief and Rehabilitation Department of the Himachal Government. After wasting over a year for a reply from the Ministry, I moved the Central Information Commission,” said Awasthi.

Another Pong Dam oustee, Ashwani Kumar has also got justice from the Himachal High Court. Kumar could not even claim land from the Rajasthan Govt in lieu of his 272 kanals that was acquired about 50 years ago for construction of Pong Dam. The Relief and Rehabilitation Department of Himachal Govt had not given him the eligibility certificate on the basis of which he could have sought land from Rajasthan Govt. He was recently issued the eligibility certificate after the High Court order. The court also ordered the Rajasthan Govt to allot land to Ashwani Kumar. (The Tribune 220510)

Draft The Dam Safety Bill, 2010 approved The Union Cabinet has approved the proposal of the Ministry of Water Resources for enacting legislation on Dam Safety. The Dam Safety Bill 2010 will now be introduced in the Parliament. The main objectives of the legislation are:-

- The new legislation will help the States in adopting uniform dam safety procedures to ensure safety of dams and safeguard benefits from such dams.
- It also provides for proper surveillance, inspection, operation and maintenance of dams of certain parameters (called specified dams) to ensure their safe functioning, and thereby protect persons and property against risks associated with dam failures.
- Provisions have also been made in the legislation concerning the necessities of periodical inspections, instrumentations and establishment of hydrological and seismological stations.

• It also seeks to address the issues of emergency action plan and disaster management, and enlists the requirements of comprehensive dam safety evaluation.

This Bill seeks to enjoin responsibility on Central Government, State Governments and owners of specified dams to set up an institutional mechanism for ensuring safety of such dams and reporting the action taken. It defines the duties and functions of these institutions in relation to perpetual surveillance, routine inspections, operation and maintenance of log books, instructions, funds for maintenance and repairs, technical documentation, reporting, qualifications and trainings of concerned manpower etc. The Bill addresses the issues of emergency action plan and disaster management, and also enlists the requirements of comprehensive dam safety evaluation.

Background The Andhra Pradesh Legislative Assembly adopted a Resolution in March 2007 that the Dam Safety legislation should be regulated in the State of Andhra Pradesh by an Act of Parliament. The West Bengal Legislative Assembly also passed a Resolution in July 2007 empowering the Parliament to pass the necessary Dam Safety Act. As per Article 252 of the Constitution, Parliament of India is empowered to legislate on any subject in List II of Schedule 7 of the Constitution of India, provided, two or more States give consent for such legislation and the resolution is adopted by their respective legislatures empowering the Parliament to pass an Act in this regard, which shall apply to those States. (PB 130510)

Narmada pipeline plan Rejected Putting an end to the controversy, Gujarat government has rejected Sardar Sarovar Narmada Nigam Ltd's move in Sept 2009 to lay down underground pipelines in lieu of field channels to irrigate 18.45 lakh ha of Narmada command area across Gujarat. A note, prepared by the chief minister's office, basing on an experts' committee report on viability of the proposal reverts back to the 'open channel' approach, though making a few exceptions.

SSNNL stirred a hornet's nest last year when its then chairman said that an underground pipeline was the panacea to quickly complete the work of providing water to Narmada command area, as it would help sidestep the process of land acquisition to construct field channels. Opposition to the plan by top engineers, especially former Union water resources secretary CC Patel, who has worked as SSNNL CMD, forced the state to form an experts' panel headed by the CM's water resources advisor BN Navlawala to examine the suggestion. It submitted a 153-page report to CMO. Citing the report, the CMO note makes certain exceptions. It allows the pipeline approach in two areas adjoining the Gulf of Khambhat – Dholka-Dhandhuka area in Ahmedabad district and Kavi-Jambusar area (also called Baratrack) in Bharuch district, where 'constructing field channels is geographically not possible'. Referring to the on-the-spot assessment of

irrigation via pipeline in Rajasthan, the note says, "On the whole, such an approach is not advisable."

The CMO note asks SSNNL to quickly go in for acquiring land to construct field channels in Narmada command by paying up market rate to the farmers. Wanting land acquisition with farmers' consent to form part of the contract agreement on field channels, the note insists on quickly exploring the possibility of encouraging micro-irrigation methods by providing more subsidy than is being allowed. (The Times of India 290510)

INTER STATE ISSUES

Polavaram: AP tries to hoodwink to get national status In spite of the outstanding cases in high courts and Supreme Court, in spite of non settlement of interstate disputes with Orissa, Chhattisgarh and others, in spite of all the statutory clearances not in place, the Andhra Pradesh government has applied for National Project status and if the statements by the Union Water Resources secretary UN Panjiar is any guide, the centre is not against it. Currently, the issue is before the Expenditure and Finance Committee of the Central Cabinet and the committee has asked some questions to AP. Panjiar said that he has asked the state government to submit their replies as soon as possible. After EFC, the cabinet will take a decision. Mr Panjiar, however, expressed his preference for the Polavaram project, which he should not have since all the issues mentioned above are yet to be cleared. The fundamentalist pro dam bias of the Union Water Resources secretary is clearly showing. (Deccan Chronicle 160710)

Mahadayi dispute between Goa and Karnataka The Supreme Court on July 26, 2010 asked the Centre to spell out whether there was any proposal to set up a tribunal to adjudicate the river water dispute between Goa & Karnataka on construction of a project across the Mahadayi River. A Bench of Justices Mukundakam Sharma & Anil Dave granted six weeks for the Centre to indicate its stand & asked the parties to complete verification of documents before the Registrar. In its suit, Goa contended that the project contemplated by Karnataka in the inter-State Mahadayi river involved diversion of water outside the basin and it was not permissible. It said any abstraction of water by the upstream Karnataka would deprive the inhabitants of Goa of drinking water and consequently affect their rights. Karnataka said the proposed diversion was only for 7.56 Bcf annually out of the total availability of 180 to 220 Bcf, as estimated by the Central Water Commission, and the proposed diversion was mainly for drinking water requirement. It said the govt had no intention of utilising the waters actually without obtaining the clearances under the provisions of the Environment Protection Act, 1986. It maintained that trans-basin diversion from the surplus Mahadayi basin to the deficit Krishna basin for meeting drinking water supplies was permissible. (The Hindu 270710)

Babli row between AP & Maharashtra

Even as the Supreme Court is slated to give its verdict on Aug 16 on the contempt petition filed by the AP against Maharashtra for fixing gates on the Babli barrage built by it against the express SC order against fixing the gates, the issue became hot when the former AP Chief Minister Chandrababu Naidu decided to insist on visit to the barrage site in Nanded district in Maharashtra. Naidu's insistence came at opportune time just before the by elections in the Telengana portion of AP along the river downstream from Maharashtra. However, elections results showed that his party got no benefit from the agitation.

It is true that the Sriram Sagar dam immediately downstream in AP would not be able to fill up if Maharashtra diverts more than its share of water just in the upstream, which in turn would affect the Telengana districts. The fact that Maharashtra decided to arrest the former AP CM along with his 65 colleagues for 3 days rather than allow them to visit the barrage site seems to indicate that it has something to hide there.

Naidu says (Asian Age 260710) that not just Babli but all 14 projects are illegal constructions. He suggested that if a state government (Maharashtra) wilfully disobeys the orders of the Union Government and that of the Supreme Court, it is for the Union government to pull up the concerned state using article 355 of the constitution.

The Babli barrage is being constructed 83 km from Nanded on the Godavari river. It is 7 km upstream of Maharashtra's border with Andhra Pradesh and is expected to provide water for 58 villages and irrigate 7,995 ha of land in Nanded district. Administrative approval was given to the barrage in Dharmabad taluka on March 10, 1995. The barrage is estimated to cost Rs 220.9 crore and the government has spent Rs 165 crore.

Work started in Aug 04 and the completion deadline was 2009. The work of the barrage is nearly complete. Some works are in progress. The barrage will store 2.75 BCF (Billion Cubic Feet) water, creating a 58 km long backwater effect, claimed to be within the riverbed area. Together the 11 barrages would help store 20 BCF water. The first barrage built was Bhusni in Latur.

Maharashtra plans to build such barrages on a number of other rivers, including Tapi, Katepurna and Godavari.

The Andhra Pradesh government complained to the Central government in 2005 that Maharashtra had violated the Godavari Water Dispute Agreement of 1975 by undertaking the construction of the barrage in the backwaters of Pochampad dam (Sriram Sagar Project). It feels that the barrage will reduce the flow of water to the Sriram Sagar Project. The Central Water Commission conducted two joint meetings with officials from both the states. A meeting with chief ministers of both states was held on April 4, 2006.

A technical committee was formed to go into the details and submit a report by May 20, 2006. It was also decided that status quo be maintained on the Babli project. Two meetings of the technical panel were held, but no report was submitted. The Andhra Pradesh government filed a suit in the Supreme Court in July 2006 under Article 131 of the Constitution against the Maharashtra government. It prayed for a permanent injunction restraining Maharashtra from undertaking or proceeding with the construction of the Babli barrage within the reservoir area of SSP.

The apex court issued an interim order on April 26, 2007, saying that

Maharashtra could go ahead with the construction of the Babli barrage but should not install its gates. The Supreme Court said Maharashtra would proceed with the project at its own risk and not claim any equity due to the construction being done by it. The next hearing is scheduled on August 5, 2010.

The Maharashtra govt says the barrage is being constructed within its territory, about 7 km upstream of its border with AP, and that it is within the limits of the share of water decided by the Godavari Water Dispute Tribunal award of 1975. The Maharashtra govt also says that the Supreme court has allowed it to continue with the construction of the barrage and it is honouring the directives by not impounding the water. Naidu says Maharashtra has violated the SC order and is building gates at the Babli barrage to impound water, which would deprive Telangana of its share. (The Hindu, The Indian Express 220710, DNA 230710)



The Sriram Sagar dam immediately downstream in AP would not be able to fill up if Maharashtra diverts more than its share of water just in the upstream, which in turn would affect the Telengana districts. The fact that Maharashtra decided to not allow the AP agitators to visit the barrage site seems to indicate that it has something to hide.

FLOODS

Flood Information System in Himalayan region The International Centre for Integrated Mountain Development in collaboration with the World Meteorological Organization organised an inception meeting for a project to establish a regional flood information system in the Hindu Kush-Himalayan region. The workshop was held from 23-25 June 2010 in Kathmandu and involved the participation of six regional partner countries, Bangladesh, Bhutan, China, India, Nepal, and Pakistan. The participating countries and partner organisations reviewed the HKH-Hydrological cycle observation system and project goals, and clarified concepts, as well as agreed on a common plan of action including roles and responsibilities of all the project partners. The workshop arrived at a common understanding on flood information sharing and mutual cooperation for enhancing flood risk reduction. (www.icimod.org)

This kind of initiative is certainly welcome and long overdue. It is, however, not clear if only the governments are partners in this and if the information will go out in real time or near real time to all concerned, including people on ground to be affected by such floods. Inter governmental sharing of data has been going on at bilateral level (e.g. Indo Nepal, Indo Bhutan, Indo Bangladesh, Indo Pakistan and limited extent Indo China in recent months) but for some strange, inexplicable reasons, none of that is available in public domain. If what governments share between them on such vital issues is not available to the people on ground, it is clearly not good enough. One hopes the ICIMOD initiative goes beyond government level data sharing and makes it all available in public domain pro actively.

HYDRO PROJECTS

Under scanner IVRCL eyes Hydro foray The Hyderabad based Infrastructure company IVRCL is planning to enter hydropower sector through facilities of 100 MW in two years. The company is already involved in BOT projects in irrigation sector. However, the company is under scanner as Jharkhand has asked the centre to probe the credentials of the company before awarding any contracts to it. The chairman of the Jharkhand State Electricity Board has also demanded a CBI probe into the IVRCL deal in rural electrification in Jharkhand under the former Chief Minister Madhu Koda, now in jail under corruption charges. JSEB also said that the work of the company is not satisfactory. (Financial Chronicle 120710, Mail Today 190710)

WB consultancy for private hydro in India The World Bank has invited expressions of interest from consultants to study private sector participation in hydropower development in India. Private ownership represents 3.4 % of installed hydro capacity in India. The World Bank study is aimed at understanding the involvement of the private sector compared to the public sector in hydropower development. The study is to

evaluate the challenges constraining the private sector from taking an increased role in developing sustainable hydropower. The study is to include preparation of a "shelf" of HEPs in India's Himalayan states that have been awarded to public and private sector developers. The consultant is to review states' existing development models, such as memoranda of understanding and bidding. It is to review financing approaches and emerging models being used by developers. Work also includes comparing India's approaches to those of other countries. The work is to require ten months, beginning in Sept. (hydroworld.com, 300710)

HYDRO PROJECTS IN HIMACHAL PRADESH

Kashang workers want dues, basic amenities Denied wages and basic amenities by the company executing the 243 MW Kashang Hydroelectric Project in Kinnaur, workers have urged the Labour Commissioner to take effective steps to enforce labour laws and take punitive action against the violators. The Kashang Project Workers Union said that the workers were being made to live in pitiable conditions without basic amenities like adequate and clean water, proper shelter, toilets and washing facilities. No employment cards had been issued to most of the contract labourers and their wages had also not been paid for four months. No overtime was being paid and wage slips were also not being issued, it said. The Labour Department office at Reckong Peo had virtually become the office of the private company and the voice of workers was falling on deaf ears, the Union added. The Kashang Hydroelectric Project was assigned to the state-owned Himachal Power Corporation, which awarded major works to Hindustan Construction Company. However, Hindustan Construction Company further allotted works to subcontractors, who were allegedly exploiting workers in connivance with Labour Department officials. The project is funded by the Asian Development Bank, but the Bank seems least bothered by this abject exploitation. (Tribune 310510)

Nod to advertise 18 HEPs The state Cabinet on July 19, 10 gave nod to advertise 18 hydroelectric projects with an aggregate generation capacity of 1,357.5 MW, including three self-identified projects, under the revised policy. The Cabinet approved the revised bid document and notice inviting proposals for projects above 5 MW. The projects approved for advertising included Suil (13 MW), Kilhi-Bahl (7.5 MW), Cho Tundah (9 MW), Danchho (12 MW), Dugar (236 MW), Purthi (300 MW), Tingret (81 MW), Lara Sumta (104 MW), Rashil (102 MW), Tandi (104 MW), Patam (60 MW), Sumte Kothang (130 MW), Teiling (94 MW) and Shangling (44 MW). The three self-identified projects--Jobrie (12 MW), Nesang (10 MW) and Malana-III (30 MW) will be advertised and the parties which identified the project will be required to participate in the bid. However, they will have to match with the highest quote in case their offer fall within 70 % of the highest bidder to avail preferential right over the respective identified projects. (The Tribune 200710)

HYDRO PROJECTS IN UTTARAKHAND

FAC demands cumulative impact assessment The Union environment and forests ministry's Forest Advisory Committee (FAC) has decided not to give forest clearance to any of the proposed projects until the National Ganga River Basin Authority conducts a cumulative impact assessment study of all proposed dams. Uttarakhand has planned to build 300 small and large dams on the various tributaries of the Ganga to tap the hydel potential of the state. The Uttarakhand High Court, hearing a petition by Bharat Jhunjhunwala, had asked the FAC to study the consequences of the hundreds of dams planned by the state government through public sector units and private players.

FAC carried out a tour of the sites and consulted various stakeholders and found that in some existing dams, serious violations were occurring and the government had not considered the consequences of building dams on almost all tributaries of the Ganga. Considering that more than 60% of the hill state's land is forested, almost all projects require forest clearance under the Forest Conservation Act, 1980. Sources said the Uttarakhand government even refused to share the detailed map of the 300-plus projects it plans to build, with the FAC team. The committee noted that in view of the preliminary assessment and the fact that several dozen more small, medium and large projects were in various stages of formulation, there was potential for irreparable and irreversible damage to the entire river eco-system. It recommended that no further projects be considered by FAC without a comprehensive study of carrying capacity of Ganga in the hilly terrain up to Haridwar.

Acknowledging that it did not have the requisite expertise to conduct such a study, FAC has asked that NGRBA, which is headed by the PM, set up a committee of experts to conduct the study. While most of these were run of the river dams, cumulatively they added up to thousands of mega watts and that the proposed projects dotted each and every tributary of the state. The committee had also ordered that the study, which would be a costly one including impacts on hydrology, soil, wildlife and seismic concerns besides other issues should be funded by charging the project proponents 0.75% of the capital cost of the project which should be provided to the NGBRA to sponsor the study. (The Times of India 160710)

Studies 2 Ganga tributaries commissioned The Union environment and forests ministry has commissioned two studies on the cumulative impacts of all the hydroelectric projects planned on Bhagirathi and Alaknanda rivers -- two key tributaries of the Ganga in Uttarakhand. IIT Roorkee and the Wildlife Institute of India, Dehradun, will carry out the studies. The institutes have been asked to determine the requirement of minimum flow from the proposed and already commissioned hydroelectric projects on these rivers in their entire stretch. IIT

Roorkee would address the issues of hydrology. Its study will determine whether the acceptable limits of geomorphologic stability or of environmental sustainability, particularly of environmental flows, are likely to exceed at any small or large hydropower project sites. The IIT team will also assess if the construction of dams could reduce the water available to the people for irrigation and drinking purposes. The report will, most crucially, determine if restrictions should be placed on the development of hydropower in the Ganga basin. The ministry also decided after a meeting in end June 2010 to study thoroughly the cumulative impact of the dams on the flora and fauna in the region. WII will carry out work on this. It has been asked to make a detailed investigation into the consequences of various hydroelectric projects on the riverine ecosystem, in general, and terrestrial and aquatic biodiversity, in particular, along with a review of the effectiveness of the mitigative measures and compliance of the stipulated conditions on which various projects have earlier been cleared. While IIT will finalise its study in six months, WII will submit its report in two months. The move comes after the ministry's Forest Advisory Committee refused to clear any new projects on the Ganga basin upwards of Haridwar until a cumulative assessment is conducted. (The Times of India 210710)

Devsari Dam public hearing cancelled for Second Time Uttarakhand State Environment Protection and Pollution Control Board on July 22, 2010 organised the second public hearing on environmental issues regarding the construction of the Devsari hydro electricity project (252 MW) on river Pinder, one of the main tributary of Alaknanda River, District Chamoli, Uttarakhand. The first public hearing had to be cancelled due to intense public opposition on 13th October, 2009. Sulej Jal Vidhut Co. Ltd., a joint venture of Central Govt. and Himachal State is the project proponent. On July 22 nearly 2,000 people gathered from different villages who are facing submergence and also many who are against dams on the river. The district administration had mobilised police force sensing public opposition. After vocal protests the Public Hearing was cancelled by the authorities. However, in order to break the opposition and instil fear they arrested Vimal Bhai of Matu Jan Sangathan who has been campaigning against the big dams in Uttarakhand. Matu along with Bhuswami Sangharsh Samiti (BSS) had written a letter requesting the Union Environment Secretary, Vijai Sharma to cancel the Public Hearing. It is to be noted that back in October 2009, the Public Hearing had been cancelled due to disruption at the venue by the local people, and police had filed a F. I. R. against 11 people by name including Vimalbhai, Shri Gabbar Singh, Shri D. D. Kuniyal - Block headman, Shri Yashwant - one journalist and other 60 anonymous people. The charges pressed against 11 people were 148, 332, 427, 436, 504 IPC. The arrest has been widely condemned. (NAPM220710)

Story of a successful Campaign**No to Rupsiyabagar Khasiyabada Hydro Project**

NTPC's 261 MW Rupsiyabagar Khasiyabada project planned on the Gori Ganga river in Pithoragarh district has been mired in, now normal for Hydro projects, controversy since 2008 when the Public Hearing was deemed to have been conducted under very dubious circumstances. In June '08 at the Scheduled Public Hearing people from 30 odd villages had gathered in large numbers to protest against the lack of prior information about the project or the Public Hearing. The local administration, in the face of the massive protest, had declared the Public Hearing to be cancelled and that a suitable date would be set after full information had been provided to the community. Instead, overnight, signatures obtained through fraudulent methods were used to sign the minutes of the Public Hearing. This came as one of the many shocks to the community who had initially felt that their voice had been heard. Since that fateful day in June '08 the community and their supporters have been fighting an uphill battle with the local & state administration and the companies & contractors involved. At every stage when the community seemed to have gained some traction in getting their demands addressed, be it more accuracy in the details of displacement or the offered compensation package or a realistic idea of social & environmental consequences and the mitigation mechanisms, the Govt and the Company responded by more obfuscation and more fraudulently acquired clearances and permissions.

Since 2008 an Uttarakhand State Wide Save the River's Campaign, organized by a coalition of civil society groups, affected communities and other civil rights and environmental opinion leaders had lead to communities being more pro active in resisting hydro projects foisted on them without their consultation or consent and without adequate consideration for the living environment. In the Gori River Basin a variety of people's groups, the Parvatiya Kisan Sabha, the Jan Chetna Manch, The Munsiri Jan Sangharsh, Women's Groups and Environmental researchers combined to take on the juggernaut of the NTPC-Administration combine. Falsehoods and frauds being committed to assist the Hydro Project were brought to light, published,

publicized and information was provided to policy makers and appraisal committees. Each set of information was accompanied by representations from various affected communities, photographs and scientific proofs and references.

In the face of sustained, coordinated and intense protests the Administration and NTPC have attempted to target individuals and people's groups in order to break down the resolve of the community who wanted to see justice done. Often they were successful in their attempts be it through the dangling of the proverbial carrot and job

carrot or the use of threats and goonda's to intimidate or through the use of official machinations to displace elected people's representatives who were not favourably disposed towards the project.

As with the Fraudulent Public Hearing the Village Development Advisory Committee (VDAC), supposedly a body of affected village representatives constituted to negotiate a fair price to the displaced was another scam. Many villages refused to be part of the VDAC and even resolved in formal Gram Sabha meetings to this effect.

Overriding the concerns and issues the District Management issued an advertisement regarding the constitution of the VDAC with many people simply being nominated to this Committee, with some of them being pro project and not having any support in the villages. However this was yet another antagonistic move that helped strengthen

the resolve of the people to defend their rights and this led to sustained efforts to block any VDAC meeting. Attempts by the administration and NTPC to hold the VDAC meetings was met by sustained protests which in the end resulted in the administration having to resort to their normal bullying and holding the meeting behind closed and police protected doors because that was the only way they could coerce a few people to sign the VDAC agreement.

With the Expert Advisory Committee for River Projects recommending clearance in March 2009 to the project, the scene was set for the project to overcome any



These gross misrepresentation and falsehoods had prompted the community to continue their rallying to get justice in spite of the overwhelming odds against. Over the past 3 years elected people's representatives and other groups have made fact based representations to all the concerned people and departments and committees in order to get at least a fair hearing.

obstacles and begin their work. The EAC's 2 part clearance letter found its way quickly to the affected community who were able to see through the many gaping holes and shortcuts that the clearance was based on. The EIA itself was immensely flawed with sections copy pasted, by WAPCOS the EIA and DPR consulting agency, from other EIA's. Other critical flaws in the report were exposed - like erroneous requirements of the land, including forest land by the project, the misrepresentation of the biodiversity of the region, the ignoring of displacement issues and the falsifying of information in the dam break analysis to conveniently show the existence of no villages in the dam break zone while in actuality more than 10 villages lie in the path of an potential dam break flood.

These gross misrepresentation and falsehoods had prompted the community to continue their rallying to get justice in spite of the overwhelming odds against. Over the past 3 years elected people's representatives and other groups have made fact based representations to all the concerned people and departments and committees in order to get at least a fair hearing. This was accompanied by on the ground Gandhian protests aimed at pressurizing NTPC and the administration to be more responsive. None of the representations have received as much as a one page response from the local, district or state administration. However such detailed, repeated science and proof based sustained representations have influenced Central Government policy makers and Forest Advisory Committee (FAC) members satisfactorily enough to actually take the steps required to prevent this scam ridden project from being cleared. This has been vindicated in the FAC's recent decisions regarding the project and can be claimed to be a victory of the people.

Forest Clearance denied by MoEF The Press Release dated July 19, 2010 from the Union Ministry of Environment and Forests on this rejection said: "The MoEF under Section 2 of the Forest

Conservation Act 1980, has denied approval for diverting 217.522 ha of forest land for 30 years for construction of

261 MW Rupsiabagar-Khasiyabara Hydro-electric Project in district of Pithoragarh. The Government of Uttarakhand had submitted this proposal on 21.12.2009, it was considered by the Forest Advisory Committee (FAC) in its meeting on 25.05.2010. The FAC in its recommendation suggested rejection of the proposal since it is to be set up in a highly ecologically sensitive wildlife habitat. The committee gave the following reasons for its conclusion -

1. The project area is highly sensitive to erosion & construction of roads for the

Interestingly, the Union Ministry of Environment and Forests, the forest department of the state, the FAC and the media reports failed to acknowledge that the Environment Impact Assessment of the project done by the now infamous WAPCOS had hidden these serious issues and lied about the benign nature of the project impacts.

project will escalate this.

2. The wildlife management plan was not adequate to ensure proper safety of major endangered species.
3. The impact of the project on endangered species needs an in depth analysis.
4. The project is located in the mid stretch of the river.
5. It is one of the seven projects located along the river.

Further, The FAC on request of the User Agency (NTPC Ltd.) re-examined the proposal once again on 17.06.2010. The Committee reiterated its earlier recommendation to reject the proposal as no new facts related to the proposal had been put forward. Based on the FAC recommendations this proposal has been declined approval by the ministry."

WAPCOS's fraudulent EIA Interestingly, the Union Ministry of Environment and Forests, the forest department of the state, the FAC and the media reports failed to acknowledge that the Environment Impact Assessment of the project had hidden these serious issues and lied about the benign nature of the project impacts. It was due to the efforts of local environmentalists at

It was due to the efforts of local environmentalists at Munsiri in Pithoragarh district that this fraud on the part of the WAPCOS for this project was exposed. The detailed memorandum submitted by them to the state forest department made the state forest department sit up and expose the fraudulent EIA and NTPC claims. WAPCOS that did the EIA for this project committed a serious fraud in the process and should be black listed from doing any further EIA. This is not the first time that a fraudulent EIA has been done by WAPCOS.

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the first time that WAPCOS has been found guilty of doing fraudulent EIA. (The Economic Times 200710)

POWER OPTIONS

Renewable Power Obligation for HP The Himachal Pradesh State Electricity Regulatory Commission has framed the renewable power purchase obligation for the state which stipulates that the state has to procure 10.1% of power consumed in 2011-12 from renewable sources; the share will go up by 1% in every subsequent years till 2016. Within this share, 0.1 or about 7.3 million (requiring approximately 4 MW installed capacity) should come from solar power, that share will go up to .025% in 2013. A number of other state ERCs have also come out with similar stipulations. (The Tribune 220710)

WATER POLLUTION

Gujarat is numero uno in river pollution The prized riverfront project of the Ahmedabad city is coming up on the banks of the third most polluted river in the country — Sabarmati river. Also it may surprise you a bit to know that the first two rivers having this dubious distinction are — Amlakhadi river at Ankleshwar and Khari river at Lali village in Ahmedabad. Central Pollution Control Board has also reported highest volumes of faecal coliform — a bacteria present in human and animal excreta — in the country in Sabarmati. FC in these stretches is measured to be 2.8 million Most Probable Number in every 100 ml of the river.

The analysis forms part of CPCB's nation-wide study of inland water quality monitoring done on monthly, quarterly and half-yearly basis, involving 1,019 stations in 27 states and 6 Union territories. CPCB was surprised after tests were carried out last year between May and July and then again in January this year clearly showing that Sabarmati and the two other rivers still maintain their top slots of the worst polluted rivers in the country. In May last year, the board noted that the biochemical oxygen demand, one of the most important indicators of pollution, were observed in Amlakhadi at Ankleshwar (714 milligram/litre), Khari at Lali village, Ahmedabad (320 mg/L) and Sabarmati at Ahmedabad (207 mg/l).

In January this year again when the CPCB went to the same spots to measure BOD the situation had not improved. The BOD in Sabarmati was 77% higher and measured at 367 mg/l. In March, the BOD in Amlakhadi was 394 mg/l while the Gujarat Pollution Control Board (GPCB) standards require a BOD level of 100 mg/l. The major polluting units along the rivers include distilleries, sugar, textile, electroplating, pesticides, pharmaceuticals, pulp and paper mills, tanneries, dyes and dye intermediates, petrochemicals and steel plants, among others. According to CPCB, the major reason for polluted river stretches in Gujarat is the effluent directly discharged by the factories into these water bodies.

An observation supported by the fact that the Amlakhadi, which meets Narmada near Bharuch district, has been reduced to an effluent channel of over 1,500 chemical units in Ankleshwar, Panoli, Vilayat, Dahej and

Jhagadia. "Its true that there has been illegal dumping of waste into the Khari River. We have been issuing closure and show cause notices and some amounting to even criminal cases," says a senior GPCB official. That claim, however, is lacking any credibility. (TOI 050610)

Berger Paints probed for groundwater pollution A manufacturing unit of Berger Paints, a major decorative paint manufacturing company, is being probed for pollution of ground water in villages near the Pilerne Industrial Estate in Goa, environment minister Aleixo Sequeira told the assembly on July 19, 2010. Sequeira said the state pollution control board was conducting a hearing after residents of Saipem village filed a complaint under the Water and Air Pollution Act. "An inspection of the unit at the industrial estate has already been conducted after the complaint said that chemicals were being discharged by the company and was contaminating the ground water," Sequeira said. (The Economic Times 200710)

RIVERS

Stretch of Ganga is a Ramsar site now The 85 km long stretch of Ganga River between Narora and Brughat has been declared as Ramsar site for protection of Dolphins. Fisheries and sand mining banned in this area. It seems illegal fishing is going on in this area.

A shallow river stretch of the Ganga River with intermittent small stretches of deep-water pools and reservoirs upstream from barrages. The river provides habitat for IUCN Red listed Ganges River Dolphin, Gharial, Crocodile, 6 species of turtles, otters, 82 species of fish and more than hundred species of birds. Major plant species, some of which have high medicinal values, include Dalbergia sissoo, Saraca indica, Eucalyptus globulus, Ficus bengalensis, Dendrocalamus strictus, Tectona grandis, Azadirachta indica and aquatic Eichhornia. This river stretch has high Hindu religious importance for thousands of pilgrims and is used for cremation and holy baths for spiritual purification. Major threats are sewage discharge, agricultural runoff, and intensive fishing. Conservation activities carried out are plantation to prevent bank erosion, training on organic farming, and lobbying to ban commercial fishing. (Jansatta 020710, Ramsar.org)

Pressure to stop industrial water supply from Mahanadi The Orissa government has come under pressure to discontinue water supply to industries from Mahanadi River and form a Water Commission to study water availability in the state's largest river. A newly formed forum comprising leaders of various political parties and social activists, have called upon the state government to discontinue water supply from Mahanadi to industrial houses failing which it would launch a vigorous protest campaign across the state. Mahanadi River is the lifeline of Orissa. The Hirakud dam, Naraj and Jobra barrages were constructed over it basically to cater to the irrigation and drinking water requirements.

However, the present government is deliberately allowing the industrial houses to draw water from these places at the cost of the farmers," said a leader. Water from Jobra barrage could not be supplied to farmers during the kharif season last year because of inadequate availability of water, the situation in coastal Orissa could somehow be saved after 3000 cusecs of water was released from Hirakud dam during Sep 30-Oct 30.

Hirakud dam, which was constructed half a century ago, has lost some of its live storage capacity due to siltation and construction of dams and barrages in Chhattisgarh. Hydro-power generated from the dam has also come down. When the water flow into the dam has gone down drastically, the government is committing water from it to heavy power and metal industries. Farmers are committing suicide due to lack of water. (The Economic Times 180710)

WATER BUSINESS

Tata Pepsi JV Tata Global Beverages (formerly called Tata Tea) and Pepsi have announced a Joint Venture, which is likely to begin with developing "affordable" bottled water at prices below Rs 10 a liter. (Business Standard 020810)

Delhi Water Sector Privatisation Delhi government seems to have selected the path of piecemeal, backdoor privatization of various components of water sector. The latest in the line is Bhagirathi Water Treatment Plan. The Delhi Jal Board hopes to spend Rs 100 crores over the next few months to modernize this plant. The company that will get the contract for this will also be asked to manage the plant for the next 10 years. Earlier Sonia Vihar WTP, a couple sewage treatment plants and billing and collection in North Delhi has already been handed over to private agencies. (The Economic Times 190510)

URBAN WATER SUPPLY

89 towns of Rajasthan get water by train This should be quite a shocker. In July 2010, 89 of the 180 municipal cities and towns are being supplied water by tankers and trains as a main source. 8000 of the 20676 villages are getting water by tankers. The state government has prepared a Rs 33000 crore drinking water scheme for the state. Two days later, several parts of the state were affected by, hold your breath, floods... (The Tribune 260710)

Delhi Haryana Water Dispute on Munak As per compilation made by the Upper Yamuna River Board, on receipt of the relevant data from Government of Haryana, the quantum of Yamuna water made available to Delhi during the years 2006-07, 07-08 and 08-09 is as follows: 2006-07 - 179.98 MCM (Million Cubic Meter), 2007-08 - 163.92 MCM, 2008-09 - 180.01 MCM.

Hon'ble Supreme Court of India in its order dated 29.2.96 directed that "Delhi shall continue to get as much water for domestic use from Haryana through river Yamuna which can be consumed and filled in the reservoirs of Wazirabad and Haiderpur Water Treatment

Plants. Both these reservoirs shall remain full of their capacity by the water supplied by Haryana through river Yamuna and Western Yamuna Canal". Hon'ble Supreme Court of India in its order dated 10.5.2000 stated that "pending further consideration, we direct that 125 cusec of water which may be arranged by the National Capital Territory of Delhi from Bhakra Beas Management Board (BBMB) shall be carried out through the States of Punjab and Haryana to Delhi for the purpose of treatment at Nangloi Water Treatment Plant". As per the data supplied by Haryana to Upper Yamuna River Board (UYRB), it is generally complying with the Orders of Hon'ble Supreme Court.

Of late, Government of NCT of Delhi has demanded that 80 MGD of additional water may be supplied to them by Haryana as a result of saving in losses due to construction of Carrier Lined Channel. Various meetings have been held in the Prime Minister's Office, Ministry of Water Resources and Upper Yamuna River Board in the matter. However, the Government of Haryana has not so far agreed to the above claim of Govt. of NCT of Delhi stating that Delhi is already getting more water in compliance of Hon'ble Supreme Court's Orders and therefore, it is not entitled to get savings in the losses due to construction of CLC. This information was given by the Minister of State for Water Resources, Shri Vincent H. Pala in a written reply in the Lok Sabha on July 28, 2010. (PIB 280710)

INDUSTRIAL WATER SUPPLY

Water tariff for industries up in Orissa The Orissa State Cabinet on July 30, 2010 approved water tariff hike for industrial, commercial and energy sectors. The Government did not touch the domestic front. The Cabinet meeting decided to amend the Orissa Irrigation Rules, 1961. After the hike, the Water Resources department hopes to collect Rs 200 cr from the commercial/industrial sector and Rs 6 cr from the energy sector. The water rate was last revised in 1994. The tariff will have two slabs. One for consumption up to 5 cusecs of water, the other for use exceeding the amount. The rate for manufacturing of 1,000 tiles or bricks, which was Rs 5 for drawal of water from Government sources, has been revised to Rs 25. The rate for drawal of water from irrigation/ works department sources will be Rs 30, up from Rs 6. Similarly, for use of less than 5 cusecs water by industries or for commercial purposes, the rate has been revised to Rs 1,550, up from Rs 200 for one lakh gallon from Government sources. Use of water from department sources has been enhanced to Rs 1,900, up from Rs 250. For industries using more than 5 cusecs water, the rate from government sources for one lakh gallon has been revised to Rs 2,050, up from Rs 200. From department sources, it will be Rs 2,550, up from Rs 250. Small-scale industries will have to pay Rs 4.50 for 1,000 litres compared to Rs 3.40 earlier from govt sources while from department sources, it will be Rs 5.60, up from Rs 4.20. The rate for use of groundwater

has also been revised. For industries consuming less than 5 cusecs, the rate for one lakh gallon has been revised from Rs 200 to Rs 3,100. For more than five cusecs, the rate has been revised from Rs 200 to Rs 4,100. For the first time, water rate will be charged for use in hydro-power projects. The rate for production of 1 kw power by using water from government sources will be 4 paise while from department sources, it will be 5 paise. (Indian Express 310710)

WATER SECTOR

UN General Assembly declares water is a human right Safe and clean drinking water and sanitation is a human right essential to the full enjoyment of life and all other human rights, the General Assembly declared on July 28, 2010, voicing deep concern that an estimated 884 people worldwide do not have access to clean water and a total of more than 2.6 billion people do not have access to basic sanitation. Studies also indicate about 1.5 million children under the age of five die each year and 443 million school days are lost because of water- and sanitation-related diseases. The 192-member Assembly also called on United Nations Member States and international organizations to offer funding, technology and other resources to help poorer countries scale up their efforts to provide clean, accessible and affordable drinking water and sanitation for everyone. The Assembly resolution received 122 votes in favour and zero votes against, while 41 countries abstained from voting.

The resolution also welcomes the UN Human Rights Council's request that Catarina de Albuquerque, the UN Independent Expert on the issue of human rights obligations related to access to safe drinking water and sanitation, report annually to the General Assembly. Ms. de Albuquerque's report will focus on the principal challenges to achieving the right to safe and clean drinking water and sanitation, as well as on progress towards the relevant Millennium Development Goals. The MDGs includes the goals of halving the proportion of people who cannot reach or afford safe drinking water and halving the number who do not have basic sanitation. (UN News 280710)

QUOTES

"Tribal Affairs Ministry is a very small ministry with people who consider it a punishment posting... They are not interested in addressing land alienation or displacements or forestry. They are just running a racket. Where is the tribal welfare happening?...Out of the total tribal dominated areas of this country, Naxals are hardly present in 20 % places. Tell me, what has the government done in the other places? Do the tribals in Kanker (Chhattisgarh) or Banswada (Rajasthan) enjoy development? Who has stopped the government from implementing its programmes properly in these non naxal areas?"

NC Saxena, member, National Advisory Council
(Business Standard 010610)

PAKISTAN

Floods breach century-old record: Over 1400 dead

An almost 110-year-old record of river flow was broken when 1.034 million cusecs of water passed the Chashma barrage on Sunday afternoon. The flood has played havoc with lives and property in upstream Khyber Pakhtunkhwa and Punjab. An irrigation expert said that the highest flow recorded previously at the point was in 1901 when it reached about 900,000 cusecs. A large part of Khyber Pakhtunkhwa had been affected at that time as well. "The biggest-ever flood in Pakistan's history was recorded at about 4 pm on Aug 1 when 1,034,000 cusecs crossed Chashma," an official said. In 1976, the flows at Chashma had touched 750,000 cusecs. In the current flood at least 2.5 to 3 million people have already been affected. The United Nations said around 980,000 people had lost their homes or had been forced to flee.

The country's highest flood-related human loss was 1,008 deaths recorded in 1992. Most of the losses were caused by the Jhelum and Chenab rivers in Azad Kashmir and Punjab. The loss of lives this season has already breached the 1992 level. The official said the authorities in Sindh had been warned of an extraordinarily dangerous situation in areas adjoining Sukkur and Guddu barrages because of rising flows. Some of the upstream embankment may have to be breached for the safety of the barrages and army has been kept on standby for that. The flows in Indus at Kalabagh were 'exceptionally high' with 840,000 cusecs.

Substandard Flood protection projects

Despite spending over Rs 55 billion on flood protection projects, the country has suffered a loss of over Rs 385 billion, 7,563 lives and about 99,000 villages in floods since 1973, mainly because of substandard construction and a poor monitoring mechanism. The current floods have caused the highest human and financial damage in a year, although over Rs30 billion was placed at the disposal of the Federal Flood Commission — the central flood monitoring and forecast agency — for strengthening river embankments and bunds. Initial estimates suggested that the rehabilitation work would cost at least \$3.5 billion after the relief operation.

The structural flood protection works for disaster risk reduction had made little progress. "Many projects exist only on paper and the quality of construction of others is substandard because of poor monitoring," an official said. Most of the projects carried out by the flood commission were of poor quality. Embankments and bunds seldom withstand even medium flood and require fresh investments each year. An engineer alleged that as much as half of the funds allocated for flood protection was embezzled. Pakistan has faced 12 major floods since 1973. As an 'exceptionally high' flood in the Indus threatened the Jinnah barrage in Kalabagh, the authorities on July 30 blasted the spur on the right bank of the river. (Dawn 020810, 030810, 040810, BBC 040810)

BHUTAN

Bunakha dam impacts The 180 MW Bunakha hydropower project that will be come up along the Wangchu would have to spend about Nu 2.2B on environment management, according to estimates made by the Indian council of forestry research and education. Occupying 484.61 ha of land, the project would have to resettle and rehabilitate 5,486 people from the four gewogs of Chapcha, Geling, Bunakha and Chaina chia in Chukha, and compensate for the private land the project would acquire.

The project area is also home to five species of mammals, such as Himalayan black bear, Assamese macaque and Hanuman langur, some 21 species of butterflies and 62 species of birds, including rare species like the white bellied yuhina, white browed bush robin and yellow billed chough. Of the total, 470.21 hectares is forest land and 14.40 hectares private land, states the study. The project shall submerge 350 hectares of land that comprise of 338 hectares forest land and 12 hectares of private land.

"Hatchery is the best option for fishery management at such projects," the director (technical) with Tehri hydro development corporation, DV Singh, claimed.

However, Singh did not say that THDC has very poor record on environment issues and its projects in India face prolonged opposition.

Measuring 91 m by 43 m, the surface power house is proposed to be located on the left bank of Wangchu, about 200 m downstream of the dam. The 188 m tall dam and a reservoir running 17 km, officials from the TDHC, said the project would take about six years to be completed. With a memorandum of understanding signed between THDC and Bhutan on June 24, an updated detailed project report is underway and is to be completed by March 2011.

THDC has also been assigned the responsibility of updating the project report for the 4060 MW Sankosh multipurpose project in Bhutan. To facilitate the work, THDC has established an office in Phuentsholing, Bhutan and offices at the Bunakha and Sankosh project sites. (Kuensel 290710, International Water Power and Dam Construction 250610)

Bengal writes to Centre for survey in Bhutan The W Bengal power minister Nirupam Sen has written to the Union power minister seeking sanction to conduct surveys in Bhutan for setting up hydel power stations in north Bengal, Sen told the assembly. It was possible to set up hydel power stations on the Raidak and Torsa rivers, which flowed through north Bengal. For these, it was necessary to conduct surveys on water availability in the upper reaches of the rivers, which originated in Bhutan. (The Times of India 010710)

NEPAL

Kosi High Dam Survey faces opposition The survey work for the Kosi High dam in Nepal is facing opposition from the CPI (Maoist) party in Nepal. A group of Maoists' leaders from party's regional affiliates, namely, Kirati Liberation Front and Limbuwan Liberation Front asked the Indian surveyors to stop work, else punitive actions will follow. The Party leaders said that the Dam would submerge some 83 Village development committees in the districts of Sunsari, Dhankuta, Khotang, Bhojpur and Sankhusabha.

"Sapta Koshi High Dam is a project that is not in Nepal's interest," says energy expert Mr. Hari Man Shrestha who is a council member, Center of Energy Studies, Institute of Engineering, Nepal. "Officials of the Nepali establishment are deeply caught up in India's water politics", he adds. "There is also no guarantee that this dam will prevent further devastation in India's Bihar State for long as beamingly cherished by the Indian planners. It is a suicidal project for Nepal", expert Buddhi Narayan Shrestha concludes.

Former Water Resources Minister of Nepal Dipak Gyawali says, "It is extremely expensive, does not address the primary problem of sedimentation (the reservoir will fill up too soon with Himalayan muck), has no convincing answer regarding the cost of attending to high seismicity in the region as well as diversion of peak instantaneous flood during construction (it is a major engineering challenge with no easy solution), and will create more social problems when indigenous population in Nepal have to be evicted from their ancestral homes". Gywali is an acclaimed water resource expert. "I think neither India nor Nepal is in a position to afford the technical, economic and social costs associated with it", he concludes. (Kantipur, The Telegraph 060610)

CHINA

Diminishing claims of flood control capacity of 3-G Dam The flood control capacity of the Three Gorges Dam, the world's largest hydropower project, is designed to be limited, a senior engineer said amid mounting concerns over the project's ability to manage floods. The first claim released in June 2003 was that the dam "could fend off the worst flood in 10,000 years". The second, dated four years later, changed that number to "the worst flood in 1,000 years". In Oct 2008, the number was again modified to "the worst flood in 100 years."

The 181.5 billion yuan (\$26.5 billion) dam was designed to withstand floods with water flow of 83,700 cubic meters per second, covering the Jingjiang River area and the Chenglingji region in Hubei and Hunan provinces, Zhao Yunfa, deputy director of the China Three Gorges Corp's cascade dispatch center said. "The dam's flood-control capacity is 22.1 billion cu m and protects, by design, a limited area any flood with water

flow exceeding 122,000 cu m per second would put the dam's own safety at risk," he said. China Three Gorges Corp's chairman Cao Guangjing said "The peak flow this time was historical. But the frequency, peak period and volume of water were all comparatively limited - the worst in about 20 years. The dam is far from displaying its full potential". (China Daily 230710)

3.45 lakh to be displaced for South to North Water Transfer scheme China will move 345,000 people, mostly poor villagers, within about two years to make way for a vast scheme to draw on rivers in the south to supply the north. This will be the biggest displacement China has undertaken since building the Three Gorges Dam, the world's biggest hydroelectric scheme. The project involves an eastern route to take water from the lower reaches of the Yangtze River and a central route to tap rivers flowing into the Danjiangkou Dam in central China. The scheme has been troubled by delays, cost increases, pollution and the burden of resettling displaced farmers.

Zhang Jiyao, the official in charge of the project, said the mass move for the central route could be more demanding than the Three Gorges Dam move, which sparked years of contention with displaced residents unhappy with compensation and conditions. "because the displacement for the South-to-North Water Transfer Project must be completed in over two years".

The drive to finish displacement for the rising Danjiangkou Dam by 2013 has already stirred complaints from farmers, who say they are being moved to poorer land with dim job prospects. The dam is being raised to store water, which will then be drawn along 1,421 km (883 miles) of canals and tunnels to Beijing, the nearby port city of Tianjin and surrounding areas. (Reuters 300610)

23 killed at hydro construction site A landslide killed at least 23 workers at a hydroelectric power plant construction site along a mountainside in southwest China. The accident, apparently triggered by heavy rainfall, happened in Kangding County in the Ganzi Tibetan region of Sichuan Province at about 1:25 a.m. The landslide crushed work sheds at the construction site. (Hydraworld 150610)

24.3% rivers unfit for any use Almost a quarter of China's surface water remains so polluted that it is unfit even for industrial use, while less than half of total supplies are drinkable, data from the environment watchdog shows. Inspectors from China's Ministry of Environmental Protection tested water samples from the country's major rivers and lakes in the first half of the year and declared 49.3 % to be safe for drinking, up from 48 percent last year, the ministry said in a notice posted on its website (www.mep.gov.cn). Another 26.4 percent was said to be categories IV and V -- fit only for use in industry and agriculture -- leaving a total of 24.3

percent in category VI and unfit for any purpose. China classifies its water supplies using six grades, with the first three grades considered safe for drinking and bathing. {It seems China is doing much better than India, for % of river lengths where water is drinkable would be much lower in India.} (Reuters 270710)

THE WORLD HYDRO

Renewable capacity addition surpass Big Hydro The new stats, from the "Renewable Energy Policy Network for the 21st Century," or shows that additions in installed capacity of large hydro in 2009 compared to solar and wind lagged even further behind than I had guesstimated. The 38 GW (1 GW = 1000 MW) of wind turbines commissioned in 2009 is 36% greater than the 28 GW of large hydro. While wind installations surged by nearly a third in 2009, the REN21 numbers indicate that big hydro grew by less than two percent (half a gigawatt) from the previous year. The dammers will never again get close to wind power's annual additions.

However the small print of the REN21 report shows that big hydro additions in reality probably fell in 2009. REN21 changed how they define the small/large hydro split this year. The small hydro industry generally uses a 10 MW upper limit, but some countries have much higher limits - 25 MW in India, 30 MW in Brazil and the US, and a not-very-small-at-all 50 MW in China. In the past REN21 used the national standards, but this year they have made their statistics more consistent by switching to the 10 MW cut-off.

This changed definition has resulted in an apparent collapse in small hydro installations, from 7 GW in 2008 to just 3 GW in 2009. Because small hydro is benefiting from many of the same renewable support policies as wind and solar, it is unlikely that there has in reality been any significant drop in small hydro installations as defined by governments. Taking 2008 small hydro installations as 3 GW and shifting 4 GW from the "small" to the "large" column would give 2008 large hydro additions as 31.5 GW. This means that 2009 may well have seen a **13% drop in big hydro additions**. Among the other pieces of good news in the REN21 report are:

- "Wind power existed in just a handful of countries in the 1990s but now exists in over 82 countries."
- "Grid-connected solar PV has grown by an average 60 % every year for past decade, up 100-fold since 2000."
- "Concentrating solar thermal power emerged as a significant new power source during 2006–2010 . . . By early 2010, 0.7 GW of CSP was in operation, all in the U.S. Southwest and Spain, with construction or planning under way for in many more countries."
- "For the second year in a row, in both the United States and Europe, more renewable power capacity was added than conventional power capacity (coal, gas, nuclear). Renewables accounted for 60 % of newly installed power capacity in Europe in 2009." (Patrick McCully, International Rivers, 020810)

A Bright Future For Hydro – Without Dams

A quiet revolution is underway in the world of hydropower. An emerging non-dam based hydro industry holds the promise of economically viable technologies that do not deplete resources or warm the planet, and do not wipe out species, ecosystems and cultures. With supportive policies from governments, non-dam hydro could become a key part of the world's energy mix over the coming decades, and could, as wind power already has, overtake big-dam hydro in terms of its share of new capacity additions.

A tidal turbine (SeaGreen) Non-dam hydro comes in a diversity of forms. It includes all technologies to generate electricity using water without dams. The two sectors receiving the most attention are wave power and "hydrokinetic" turbines that capture energy from the flow of water in rivers, estuaries and ocean currents, and even irrigation canals and water supply and disposal pipes. (Hydrokinetic turbines are also referred to as "instream," "stream" or "free-flow" turbines.)

Not all non-dam hydro technologies may be benign and environmentally appropriate at all sites, but it appears likely that many of the technologies could be very low impact compared with dam-based hydro and other conventional generation technologies. While the output of river flow hydro will, like run-of-river dams, be reduced in dry seasons and droughts, tidal and ocean power is highly dependable and can help reduce the vulnerability of electrical grids to climate change.

Funding for R&D of non-dam hydro has been meager until very recently, but is now being rapidly ramped up from both public and private sources, especially in Europe and North America. "We're at the stage of needing to see which of these technologies works and whether they can be scaled up," said Neil Kermode of the European Marine Energy Centre, in a December interview with the BBC. "That requires steady investment. Look what the Danes did with wind: investments year after year paid off and now they earn billions in exports. There is a huge potential - absolutely huge amount of energy out there - in fact we don't know how much but it is epic."

Unconventional Potential In January 2010, consulting firm Pike Energy published the most comprehensive assessment yet of global non-dam hydro potential and possible rate of deployment. Pike estimates that if the European Union and US continue to increase incentives for non-carbon energy, by 2025 the world could have installed 3,000 MW of river flow turbines, 4,000 MW of ocean current turbines, 57,000 MW of tidal stream turbines and 115,000 MW of wave energy. By comparison, current global installed large hydro capacity is around 770,000 MW.

Hydrokinetic technologies include turbines that look just like underwater wind turbines built on the riverbed or

hanging upside down from barges anchored in the river; barges with turbines like water wheels on old-fashioned paddle-steamers; "helical turbines" that look like the blades on a hand-pushed lawnmower; and, more experimentally, hollow cylinders placed horizontally across rivers that move up and down as the river flows past them.

Underwater turbine There appear to be no significant engineering challenges to installing and operating free-flow turbines in rivers. Research and development efforts are focused on bringing down costs and ensuring that the turbines and associated facilities do not harm fish or other aquatic life. So far it appears that the environmental impacts of the technologies will be low.

The drawback to river-flow technologies compared to conventional hydro is that the potential energy from a given volume of falling water, which is what is exploited by an old-fashioned dam-based plant, will always be far greater than the kinetic energy from flowing water. So the laws of physics dictate that non-dam systems can never extract as much energy from rivers as can dams.

The first river flow turbine to enter commercial operation in the US came fully on-line in August 2009. The small turbine, capable of producing just a tenth of a megawatt, and looking something like a household blower fan, hangs beneath a barge immediately downstream of a navigation dam on the Upper Mississippi River at Hastings, Minnesota. Initial monitoring reportedly shows that the turbine is almost completely safe for fish.

A 2007 report from the Electric Policy Research Institute estimates the US river hydrokinetic potential at 10,800 MW. A 2009 study for the National Hydropower Association by Navigant Consulting projected that with current incentives for renewables in place, 500 MW of hydrokinetic turbines could be installed in US rivers by 2025. With a clear policy commitment to this new energy source, 2,000 MW could be installed.

There is also a small, but useful, potential for "conduit hydro" - kinetic turbines installed in pipes and irrigation canals. The beauty of conduit hydro is that it has almost zero environmental impact. The California Energy Commission estimates that the state has the potential to generate 255 MW from existing pipelines and canals. In neighbouring Nevada, wastewater from Las Vegas will soon be flowing through two 8 MW turbines on its way from a new treatment plant into the reservoir behind Hoover Dam.

Since 2005 the water piped down from a nearby mountain reservoir to supply Bogotá has flowed through a 13 MW hydro project. Areas with extensive canal irrigation networks such as the Indus valley in Pakistan and the plains of northern India should have considerable conduit-hydro potential. (World Rivers Review March 2010)

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YOUR LETTERS

As always the latest (Apr May 2010) issue of *Dams, Rivers & People* is as hard hitting as ever and a joy to read for long suffering campaigners for sustainable water resource use. However, in your eagerness to corner the profligate Water Resource Management Establishment in this country you have in the brief editorial piece made a partial generalisation that is a bit illogical. You have said that because groundwater irrigation depends on water recharge from the rains it is also rainfed as also are small water harvesting structures. On the basis of this you have said that rainfed agriculture extends over 89% of the Net Cultivated Area and only 11% is served by big irrigation projects. But even the water stored in large dams can be claimed to be rainfed as it is dependent on the surface runoff and the base flow. *DRP* has to be logically correct in its writings because it is in a very important way the mouthpiece of the sustainable water management movement in India. The distinction has to be made not by whether an agricultural system is rainfed or not but by whether it is using socially and environmentally sustainable technologies or not. Consequently, groundwater extraction by tubewells is anathema because it is a socially and environmentally unsustainable technology as is big dam irrigation. In fact even groundwater extraction from dug wells can become problematical if too much of it is done with the use of motorised pumps, particularly in drought prone areas. Thus, there has to be a thorough study of the relationship between rainfall, surface runoff, natural and artificial recharge and groundwater and surface water retention in an area to arrive at the amount of water that can be sustainably consumed. This is a complex exercise that requires appropriate technical expertise and community involvement both of which are absent from current water resource planning in this country. Every body these days talks about water recharge but how many are talking about controlling water consumption through the use of sustainable technologies and communitarian rather than state or corporate control of water resources.

Rahul Banerjee, Indore (Madhya Pradesh)

Many thanks for this observation. You are right that to describe all groundwater irrigated areas sourcing water from rain is factually incorrect as well as socially and environmentally undesirable. Your suggestion of more detailed analysis in this regard is very correct. The basic thrust of that brief editorial note was to emphasise that the overwhelming agenda of the water resource establishment is to try to increase the irrigation from major and medium irrigation projects that are serving just 11% of Net sown area and that proportion and absolute figure of area irrigation by these projects are constantly declining, as now also corroborated by the Mid Term Appraisal of the 11th Five Year Plan, see this issue of DRP.

-editor

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