

Lead Piece



Jaswant Sagar Dam Collapse: A Wake up call

The Collapse of the 118 year old Jaswant Sagar Dam in Luni River basin in Jodhpur

district in Rajasthan on July 8 and the wide spread destruction caused in the downstream area should serve as a wake up call for all concerned. India's aging dam population, absence of proper maintenance of the dams and absence of accountability mechanisms is going to increase the frequency of dam disasters in years to come. When the increased frequency of high intensity rainfall events due to global warming is added to this already heady mix, the consequences could be grave. Here we must note at the outset that Rajasthan was one of the few states where the World Bank funded Dams Safety Projects was implemented. And we may have got away without death of people this time, but we may not be that lucky next time.

The 43.38 m high Jaswant Sagar Dam is only one of the 100 large dams (of the total population of over 4600 large dams in India) that are already more than 100 years old. The largest number from this stock is in Rajasthan, at 27 large dams that are over 100 years old. In addition, there are 381 large dams in India that are between 50 and 100 years old. And just to add a warning sign, not all dams built over last 50 years are safe. In fact, according to Madhya Pradesh Govt, the state has 168 dams which can be called distressed dams, out of which, 63 dams are less than 50 years old.

Moreover wrong operation of even younger or "modern" dams can lead to disaster. As we saw in the monsoon of 2006 when the sudden release of high quantum release of water from Ukai dam on Tapi river in South Gujarat lead to unprecedented flood disaster in Surat city and surrounding areas. This disaster was completely avoidable, had the dam authority taken timely action based on available information.

India is supposed to have an elaborate dam safety mechanism in place, starting from the Resolution

adopted at the First Conference of State Ministers of Irrigation held at New Delhi as far back as on the July

17-18, 1975 which reads, "The Conference recommends that in view of the increasing number of large dams in India, the Government of India may constitute an Advisory Dams Safety Service to be operated by the Central Water Commission." The Government of India constituted Dam Safety Organization in the Central Water Commission in June, 1979 to assist the State Governments to locate

causes of potential distress affecting safety of dams and allied structures and to advise the State Governments in providing suitable remedial measures.

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The Rajasthan Dam Safety Committee suggested (in November 1996 when the World Bank funded project was still on) removal of defects in the Jaswant Sagar Dam, viz. erosion of down stream area, signs of abrasion and cavitations etc. developed in the dam. The Comptroller and Auditor General report for Rajasthan in 2001 noted that none of that was done and in stead money was spent on other nonessential works.

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PEOPLE'S COMMITTEE REPORT

2006 GUJARAT FLOODS: DAM MADE DISASTERS

People's Committee on Gujarat Floods 2006 report has blamed the Gujarat government for last year's floods in Surat and other areas in Gujarat. The Committee has concluded, "A strong prima facie case can be made out that all those persons who took and implemented this decision in face of rising waters in the reservoir are guilty of criminal negligence and are liable to be prosecuted for 'culpable homicide not amounting to murder' (Section 304) and other offences under Indian Penal Code."

A 'People's Committee on Gujarat Floods of August 2006' was formed by 'Narmada Abhiyan' and Gujarat Sarvodaya Mandal' under the Chairmanship of former Acting Chief Justice of Gujarat High court, Justice RA Mehta to investigate these floods and report on what actually happened during floods, how did people cope with them, which factors caused these floods and whether they could have been averted or not and to give recommendations for future action. The Committee has now submitted its report and below we are giving important excerpts from the report of the committee.

The floods The year 2006 was clearly the year of major flood disasters for Gujarat. The State has not witnessed such widespread floods in all the major rivers of the state in its recent history. First there was the unprecedented flood in Tapi at Surat on August 7, caused by sudden release of large quantities of water from Ukai dam. This was the biggest flood in last 34 years. The water level in the river at Surat crossed the previous highest level of 12 meters (of 1968 flood) and reached 12.5 m, submerging more than 80 % of the city under water.

More than 20 lakh people were trapped in their own or neighbours' houses without food, drinking water, milk, electricity and communication with outside world for four days and nights. About 150 people lost their lives and the economy of the vibrant city came to a standstill for nearly a month causing loss of more than Rs 21000 crores!

Just after the floodwaters started receding from Surat on 11th August, large parts of Central and North Gujarat too were drowned under floodwaters. Huge quantities of

water had to be released in Mahi River from Kadana and Panam dams, submerging many low lying areas in Panchmahal, Dahod, Vadodara, Kheda and Anand districts. Similarly releases from Dharoi and Mazam dams on Sabarmati River flooded low-lying areas of Ahmedabad city and other downstream villages in Ahmedabad district. Large parts of Vadodara city also came under water due to floods in Vishwamitri and also due to water logging caused by incessant rains coupled with inadequate storm water drains. More than 60,000 people had to be evacuated from low-lying

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areas in these districts.

There was a widespread perception that all these floods were not simply caused due to natural factor of heavy rainfall but also due to various man-made factors. For instance most people in Surat believed that Surat flood was largely caused by the faulty operation of the Ukai dam during the flood and could have been averted if the Ukai authorities had started releasing water in a regulated manner from the beginning. Similarly in cases of Kadana and Dharoi too there was widespread perception that these floods could have been easily controlled by initiating controlled release of water from the dams as soon as flood like situation had developed in upstream States of Rajasthan and Madhya Pradesh. Then there were other factors of faulty urban planning and non-maintenance of traditional water bodies and water ways. Similarly newly constructed roads (Express

Analysing the inflow, outflow and the data of levels of the Ukai dam, the People's Committee Report argues why the Surat floods were a man-made disaster.

highway) and canals (Narmada canal) are also reported to have led to flooding in many areas.

On the other hand, the State govt has been maintaining that these were natural

floods only, largely caused by sudden influx of large quantities of water from incessant rains in the neighbouring States of Maharashtra, M.P. and Rajasthan. And that there were no ways to avert these disasters.

Almost all who appeared before the Committee at Surat and Vyara claimed that this flood disaster was largely caused by gross mismanagement of Ukai dam operation and could have been easily averted, or at least minimized, if the authorities in charge of the dam had

taken note of all the signs of the approaching flood and initiated advance release of water from the dam in the first week of August. Instead they continued to fill up the reservoir for as long as 34 hours after the flood waters started entering the reservoir on the night of 5th August. This created a situation where large quantities of water had to be released from the morning of 7th August, causing havoc in Surat and downstream villages.

On the other hand, the State govt has argued in the affidavit filed in the Public Interest Petition (Special Civil Application No. 17841 of 2006) before Gujarat Hgh Court argued that this disaster was primarily caused by the sudden and totally unexpected influx of huge quantity of water (nine-fold increase in inflow) in a short time span of 24 hours, which was due to nature only 'as nobody could have ever predicted such an unprecedented increase in inflow in such a short span of 24 hours'. It has also argued in the same affidavit that 'releasing water from the dam in advance was also not possible as there was no advance forecast or warning... and any such advance release of water with a view of emptying the reservoir could have proved disastrous, if subsequently there was no rain ' and that 'a flood like the one that occurred in 1998 would have impinged Surat even if the reservoir was completely empty at the time of commencement of this flood and in no case Surat could have been spared from the trauma that it suffered'.

Why the flood could've been dammed Analysing the inflow, outflow level data of Ukai dam, the People's Committee Report argues why the Surat floods were a man-made disaster.

On the two claims made by the State govt in its affidavit, it is crucial to determine which of them is factually correct. The best way to do this is to examine them vis-à-vis the factual data of inflow and outflow of water at Ukai reservoir and also that of rainfall in the catchment, which was responsible for this flood.

Inflow at Ukai The inflow at Ukai indeed started rising sharply from the beginning of 6th August and reached a peak by the end of 7th August. It remained there in the first half of 8th August and then started declining sharply,

although not as sharply as the rise. This pattern of the sudden and sharp rise in the inflow followed by not so sharp a decline as the rise is typical for all natural unregulated floods receiving water from a large catchment and is reflected in the slightly distorted 'bell' shape of the inflow curve. This is how the inflow at Ukai is expected to rise and fall during major floods, as there are no major dams in the upstream, which can store and regulate floodwaters.

The inflow increased sharply from about 50 000 cusecs in the second half of 5th August to about 10.6 lakh Cusecs in the second half of 7th August. This increase was indeed sharp. But it occurred over a period of 48 hours and not 24 hours as has been claimed by the State govt in its affidavit before the Gujarat High Court.

Gujarat High Court.

* The peak inflow during this flood was actually 12 lakh cusecs, but this was recorded only for 2 hours. The peak inflow was 10.6 lakh cusecs or more for a period of about 12 hours, which can be considered to be the peak inflow for this flood.

* This flood with a peak inflow of 10.6 lakh cusecs or more for 12 hours was indeed a major flood. But it was much smaller than the design flood with a peak of about 17 lakh cusecs, which the Ukai dam is capable of regulating in such a way that the outflow from the dam is restricted to 8.5 lakh cusecs. It was also much smaller than the highest recorded flood of 15 lakh Cusecs that occurred in 1968. Thus though big, this flood was not

that big, which the Ukai dam was not capable of handling. The flooding of Surat city and other downstream areas was also not caused by this inflow, but by the release of water, i.e. outflow, from the dam.

Outflow from Ukai Very little, if any, regulation of this flood was achieved by the operation of the Ukai dam during this flood. Moreover,

there was a delay of as long as 24 hours in increasing the outflow sharply. This was contrary to the basic principle of dam operation for flood control, which says that more water should be released in the initial phase of the flood to create space for storing peak inflow that would come later.

* Virtually no water was released from the dam till the night of 5th August, except that required for electricity generation (23 000 cusecs). The outflow was slightly increased from 23-00 hrs in the night of 5th August. About 1.4 lakh cusecs (171 MCM in 12 hrs – all MCM figures are for volume of water released during 12 hours, unless otherwise specified) of water was released in the first half of 6th August, which was slightly higher than the inflow of 141 MCM in the same period. Thereafter, 280 MCM (2.28 lakh cusecs) was released in the second half of 6th, but this was much below the inflow of about 527 MCM (4.30 lakh cusecs) in the same period.

On 7th August the outflow was increased sharply to 539 MCM (4.4 lakh cusecs) in the first half and then to 980 MCM (8 lakh cusecs) in the second half. But by then the inflow had already increased even further to 980 MCM (8 lakh cusecs) in the first half and 1300 MCM (10.64 lakh cusecs) in the second half. Thus, even at these high rates, the outflow remained behind the rate of inflow. The outflow was then increased to 1044 MCM (8.5 lakh cusecs) in the first half of 8th August and then to 1100 MCM (9 lakh cusecs) in the second half, which was the peak outflow during this flood.

* The water level in the reservoir had already crossed the prescribed rule level of 333.6 ft in the morning of 3rd August. Thereafter, the water level in the reservoir should have been maintained along the rule-curve. And yet virtually no water was released from the dam on 3rd, 4th as well as 5th August and water level in the reservoir was raised up to 335.5 ft by the end of 5th August, which was 1.5 ft. higher than the prescribed rule level of 334 ft. for the day. Thereafter too, the water level in the reservoir was continuously raised and brought up to 337 ft by the end of 6th August and then up to 339.5 ft by 8-00 am in the morning of 7th August, which was 5 ft higher than the prescribed rule level of 334.4 ft.

* By that time the reservoir was already 90% full with very little empty space (flood cushion) left for storing additional water. And the inflow was still increasing. The

result is what we got. Panic buttons were pressed and the outflow was then sharply increased in a short span of a few hours from 5 lakh cusecs at 9-00 am to 6 lakh cusecs by 11-00 am to 7 lakh cusecs by 12-00 noon and then to 8 lakh cusecs by 3 pm in the afternoon. The outflow was then increased further to the peak of about 9 lakh cusecs at 11 am on 8th August and kept at that level up to 8-00 am on 9th August. It was this high outflow of water for the prolonged periods that caused havoc in Surat and other downstream villages.

A case of criminal negligence People's Committee Report has concluded that the Govt's decision to fill up

“This was no act of nature but a situation wholly created by the fact that for as long as 24 hours after the inflow in the reservoir started increasing sharply, no major releases of water were initiated from the dam and water level in the reservoir was raised up to 340 ft. It was this long delay in releasing water from the reservoir that created a situation where large quantities of water had to be subsequently released at high rate of 8-9 lakh cusecs, causing great havoc in Surat and other downstream areas... Being fully in charge of the Ukai dam and responsible for day-to-day operation of dam, the State govt, especially its Narmada Water Resources and Water Supply department, is primarily responsible for way in which the dam is operated.”

Ukai at the earliest is in gross violation of dam operation manual, causing deaths and loss of property. Being fully in charge of the Ukai dam and responsible for day-to-day operation of dam, the State govt, especially its Narmada Water Resources and Water Supply (NWR&WS) department, is primarily responsible for way in which the dam is operated.

* The fact that water level in the reservoir was continuously raised and kept way above prescribed rule levels from the morning of 3rd August

and brought up to 339.5 ft by morning of 7th August (5 ft higher than rule level of 333.4 ft for the day) clearly indicates that State govt had made a conscious decision to fill up the reservoir at the earliest in gross violation of provisions of the dam operation Manual. Such continuous and sharp increase in the reservoir level for as long as 5 days can only be explained in light of such a decision. It is also clear that such a grave decision can only be taken at the highest level of the govt!

* This is corroborated by what the Minister for NWR&WS, Shri Narottambhai Patel, said in a press conference on 3rd August at Surat. In this widely reported press conference, he had said, 'at present the water level in the reservoir is 334 ft. and it is necessary to reach the rule level of 337 ft by 15th August. Hence there is no question of releasing any water...as it has been decided this year, Ukai reservoir shall be filled up to 345 ft after 15th August and if there is more inflow of water after that, then only the additional water shall be

released in a regulated manner... dam has earthen flanks, hence if water level goes beyond 345 ft, then there is a danger to the dam, but before that there is no question of releasing any water...in short, instructions have been given not to release any water now and only 25000 cusecs, necessary for electricity generation shall be released' (as reported in 'Divya Bhasker', Surat on 4th August). The minister has tried to give an impression that this decision of 'not releasing any water until the reservoir is first filled up to 345 ft' was taken as per the provisions of the dam operation manual. But the fact is that nothing can be more farther than this from the provisions of the manual!

* This was no empty promise (or threat?). The whole State machinery especially that of Narmada and Water Resources dept, was behind this decision and ensured that no major releases were made from reservoir before it had reached level of 340 ft! Even then, releases were initiated only because by then inflow in reservoir had increased tremendously (to 10 lakh cusecs) and was still increasing and safety of dam itself had come under grave threat!

* The State govt has also argued in its affidavit before the Gujarat High Court that nobody could predict the sharp increase in inflow on 6th and 7th August, as CWC had not issued any 'high alert' or 'emergency' warning during this flood and that some of its 'normal' inflow forecasts were also off the mark.

* It is true that no high alert or emergency warning was issued by CWC during this flood. This was because of certain peculiar conditions (that water level in the reservoir should be more than 336 ft and that rainfall recorded at 8-30 am in the morning only has to be taken into account) that have been imposed in the dam operation Manual for issuing such warnings. But even without these warnings, it was absolutely clear by 5th August night that a major flood situation had developed

in the catchment area as more than 65 mm of average rainfall had already fallen across the whole catchment. Even non-technical officers like the district Collector and the Municipal Commissioner of Surat too had 'seen' this flood coming and had warned the State govt of the grave danger it posed for Surat and other downstream areas.

This is corroborated by what the Minister for NWR&WS, Shri Narottambhai Patel, said in a press conference on 3rd August at Surat. In this widely reported press conference, he had said, 'at present the water level in the reservoir is 334 ft. and it is necessary to reach the rule level of 337 ft by 15th August. Hence there is no question of releasing any water...as it has been decided this year, Ukai reservoir shall be filled up to 345 ft after 15th August and if there is more inflow of water after that, then only the additional water shall be released in a regulated manner...

The Collector in particular is reported to have pressed for early release of water from the Ukai reservoir from the night of 4th August itself. But all these warnings from the head of the district administration fell on deaf ears.

* Also, in absence of any 'high alert' or 'emergency' warning, in 'normal' situation too dam authorities were expected to maintain the water level in the reservoir along the rule curve on the basis of inflow forecasts received from CWC. And CWC had indeed issued such forecasts on regular basis during this flood. While some of the initial forecasts were indeed off the mark, they were

promptly revised within six hours and there was no major mismatch between these revised forecasts and the actual inflow of water. The Ukai dam authorities were expected to fill up 'Forecast Based Reservoir Operation (FBRO)' forms on the basis of these forecasts and determine the rate at which water should be released from the reservoir and then operate the gates of the dam to release the water at the rate so determined.

Examination of these forms from Executive Engineer of Ukai and the Central Water Commission in Delhi clearly shows that Ukai authorities were not at all operating the reservoir on the basis of these forecasts during this entire period.

* The Committee obtained copies of these forecasts and the FBRO forms from the offices of CWC and office of the Executive engineer, Ukai division respectively. Examination of these forms clearly shows that Ukai authorities were not at all operating the reservoir on the basis of these forecasts during this

entire period. No FBRO forms were filled for the advisory warnings on 3rd and 4th August and no water was released from the dam (except 23000 cusecs required for hydro-power generation). FBRO form for forecast TU 8 issued at 12-00 noon on 5th August had shown that about 4 lakh cusecs was required to be released from the dam to bring the reservoir level down to the rule level. Yet, no water was released, except that required

for power generation. This forecast was revised by CWC at 18-00 hrs (TU8-R). FBRO for this revised forecast too indicated release of about 3.5 lakh cusecs. But outflow was increased to 1.25 lakh cusecs only and that too from as late as 23-00 hrs in the night. The same story of releasing much less water than indicated by the FBRO calculations continues till the morning of 7th August. And by this time, water level in the reservoir had already reached 340 ft and safety of dam had come under grave danger. Thereafter outflow was drastically increased from 5 lakh cusecs to 8 lakh cusecs in a matter of a few hours, making forecast based reservoir operation totally irrelevant.

* Thus, FBRO forms were filled, required rates of outflow were also determined, but water was not released at the rate so determined! That was being done on some entirely different basis (as per instructions of minister, perhaps!).

Forecast based reservoir operation was simply abandoned during this whole period. If water was released as indicated by the CWC forecasts from even as late as evening of 5th August, then also this flood could have been routed in such a way that outflow from the Ukai dam was restricted up to 6.5 lakh cusecs.

* Thus, the wide spread perception that this was a man-made disaster largely caused by the gross mismanagement of the reservoir operation is correct. And the claims made by the State govt are nothing but lame excuses. This disaster was entirely caused by the fateful decision of filling up the reservoir at the earliest in gross violation of the dam operation manual and abandoning 'Forecast Based Reservoir Operation'. A strong prima facie case can be made out that all those persons who took and implemented this decision in face of rising waters in the reservoir are guilty of criminal negligence and are liable to be prosecuted for 'culpable homicide not amounting to murder' (Section 304) and other offences under Indian Penal Code.

It is true that no high alert or emergency warning was issued by the Central Water Commission during this flood. SANDRP had said in August 2006 that this was a gross error on the part of CWC.

* Not only this, they are fully liable for all the damage that has been caused by this flood. In the celebrated case of Rylands v. Fletcher ((1868) LR 3 HL 330) hundred-forty years ago in England, it was held that the person who collects and keeps any hazardous thing (large artificial storage of water), he is liable, if the water escapes and causes any damage to any one and this liability is strict and absolute and it is no defense that the thing had escaped without that person's act, default or knowledge and our Supreme Court has actually

extended this principle of strict and absolute liability in the case of Shriram Chemicals (MC Mehta vs. Union of India AIR 1981 SC 1086) without exceptions of the English court judgment.

* In all cases of huge artificial storages of water such as dams, it is elementary and known to everyone that safety of human lives, livelihoods, welfare and economy of the people downstream depends on the proper operation of the flood control measures; larger the dam, greater the risk and greater duty of care, 'the highest standards of safety' in the words of the Supreme Court. To examine a parallel, in times of war (an emergency situation), if a sentry on duty upon his post is found sleeping, he is liable to receive death penalty under the Army Act of 1950.

* This indicates the seriousness and duty of care required when lives of others are dependent on you.

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In time of monsoon and flood season (which is also war like situation) if the sentry (the person/authority) responsible for flood control, gate operation and dam operation, sleeps (does not take timely action to moderate and control the flood), the danger and risk is to the lives and economy of millions of people downstream. This duty has to be taken with commensurate seriousness. The Committee does not suggest death penalty at all, but wants to highlight the duty to take extreme care.

That is why law and courts treat such cases as of "strict and absolute liability" admitting of no defense. It cannot be taken lightly. Dam operation manual has to be followed. One cannot pass one's incompetence, lack or error of judgment, default, negligence, malfeasance or

misfeasance to anyone else. If there is excessive, uncontrolled, or inadequately controlled or moderated flood, it speaks for itself (*Res ipsa loquitur*) that the authority responsible for the flood regulation and dam operation has failed in its duty. If there was (there was none) any doubt or balancing had to be done amongst competing factors - need for irrigation electricity etc and human safety, the decision and benefit should undoubtedly and without any argument should be in favour of the safety of large human population. There can be no argument, no compromise on that.

Outflow from dam could have been easily reduced

The People's Committee Report find that faulty urban planning, few storm water drains, encroachment on traditional water bodies aggravated flood situation.

*As in Surat, many people in Central and North Gujarat

believed that the floods in Mahi and Sabarmati rivers were also caused by faulty operation of the Kadana and Dharoi dams during these floods. The Committee has not been able to examine these claims as it was not able to obtain the data of inflow / outflow of water and rainfall in the catchment for these dams. But there are strong indications that this might actually be true for these floods too. In case of Kadana, the outflow from the dam was as high as 8.5 lakh cusecs against the peak inflow of 9.5 lakh cusecs. This in itself is enough to indicate that not

much was done to moderate this flood. The increase in inflow at Kadana had resulted from heavy rainfall in the catchment areas of MP and Rajasthan. Hence, the outflow from the dam could have been easily reduced by initiating pre-depletion of the reservoir as soon as flood situation had developed in the catchment areas of MP and Rajasthan. But this was not done. Similarly in case of Sabarmati too the increase in inflow at Dharoi dam had resulted from heavy rainfall in MP and Rajasthan and could have been easily anticipated. In this case, however, the situation was further complicated due to

simultaneous floods in Vatrak, Shedhi and Mazoom rivers. For many villages in Dholaka and Dhandhuka talukas of Ahmedabad district, this was the third time they were facing flood during this monsoon.

The People's Committee Report find that faulty urban planning, few storm water drains, encroachment on traditional water bodies aggravated flood situation... there are strong indications that what is true for Surat floods might be actually be true for the floods in Mahi and Sabarmati Rivers too and these were due to improper operation of upstream dams.

'development', etc. This is clearly seen in Vadodara city where the problem of widespread water logging during monsoon has now become a routine affair. Surprisingly this problem is mainly confined to the newly developed

In Vadodara city the problem of widespread water logging during monsoon has now become a routine affair. Surprisingly this problem is mainly confined to the newly developed posh areas, while the old city of Vadodara, planned and developed under Gaekwad rule, is largely free from this problem! This indicates that in the field of urban planning, instead of progressing, we have actually retrograded. Not enough attention is being paid to proper layout of roads and providing adequate storm water drains.

posh areas, while the old city of Vadodara, planned and developed under Gaekwad rule, is largely free from this problem! This indicates that in the field of urban planning, instead of progressing, we have actually retrograded. Not enough attention is being paid to proper layout of roads and providing adequate storm water drains. And despite three clear orders of Gujarat High court, Vadodara corporation has not maintained and cleared the traditional water bodies and water ways (drains) that were created during Gaekwad rule. Not only this, the Corporation has even recently admitted that it has no 'contour' map

of the city!

*Similarly the Committee was told during the Public hearing at Borsad that the local authority had given away land in the middle of the pond for development of a shopping complex, which is being flooded every year during monsoon. The Committee was also told during this meeting that Khambhat town, which had never faced flood in its history, was flooded in 2006. This was because a huge traditional open drain, which used to quickly carry away the rainwater, was converted to a

closed drain of smaller dimensions (by installing pipelines) and filled with soil, which was then given away to private individuals for 'development'. The capacity of the new pipeline is much lower than that of the original drain and as a result Khambhat was flooded for the first time in its history!

* Similarly removal of flood/rain waters in the low lying flat areas of Bhal (Dholaka, Dhadhuka and Tarapur) is critically dependent on proper cleaning and maintenance of traditional drains. Many such drains cross more than one talukas and are long and having large capacity. But most of these drains have not been properly maintained and cleaned for years, despite many representations. Some of them have even been encroached upon at many places. This has aggravated the flood situation in these areas. This also applies to maintenance of the minor projects. The case of Gangasagar dam in Banaskantha clearly illustrates this. This dam was damaged during the earthquake of 2001. And yet it was not repaired till 2006, although the central govt had already sanctioned the amount required for this purpose. As a result, this dam breached last year causing great damage in the downstream villages.

* In many areas newly constructed roads and canals (Express highway and Narmada Canal) have created huge barriers to free flow of water. This has led to water logging in thousands of acres of land, causing huge economic loss to the affected farmers.

* The Committee received many complaints of inadequate compensation for the damage caused by these floods. But the most shocking thing was reported at the public hearing of Dholaka. The flood waters of

Sabarmati had left behind thousands of tones sand (mixed with clay, which cannot be used for construction purpose) on the agricultural fields in Dholaka and Dhandhuka talukas. In many cases the layer of sand deposition was up to 4 to 10 ft. high. The govt (industries and mines department), instead of compensating for this loss or helping the farmers in removing this sand, actually demanded royalty from the farmers for mining this sand, as per mining rules. Rs 2500 to Rs 5000 were demanded from the farmers, depending upon the size of the farm and quantity of sand deposited. The Committee received copies of the 'notices' and also the receipts for money deposited by the farmers. Similarly those who had their houses on the govt lands were not paid any compensation for structural damage to their houses, as they were considered 'illegal encroachers'. Leaving aside the fact that such houses should have been regularized long ago, the fact that they are being denied assistance during such calamities only indicates the utter callousness and insensitivity

on the part of the govt.

(Indian Express 110707, 120707, 130707, 140707, 160707, see www.sandrp.in/floods for the SANDRP's analysis of the 2006 floods)

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It is clear from the above that SANDRP's analysis made public through press releases as early as in July and August 2006 has been proved fully correct by the People's Committee Report for Gujarat floods.

Living with the floods

Morigaon, Assam The Mayong Anchalik Unnayan Samiti, comprising of 15 villages of Mayong area in Morigaon district in Central Assam earns 3-4 lakhs in each year when their fields get flooded, as they lease them out to the fish *mahaldars* for fishing. They use the money to repair the damages done by the floods and also to run the High Secondary School. (The Hindustan Times 020807)

IRN's 2007 report The report *Before the Deluge: Coping with floods in changing climate*, from International Rivers Network lists the various ways in which living with the floods include: drainage consciousness, flood forecasting, improve dam management, be prepared, slowing the flood, De-Paving the Cities, get out of the harm's way, among others. Visit www.irn.org or write to SANDRP for a copy of this report. The report At many places around the world, there is a movement to give river its space to flow. These includes US (Mississippi, Napa), Germany (Rhine), among others. Similarly there is a movement also to restore wetlands as they play an important role in reducing flood peaks. The report also includes an essay about India's experience with dealing with floods and the performance of dams and embankments in this regard.

Knowledge As Weapon: How Auranga Dam was stopped

DUNU ROY

Ordinary working people have the capacity to learn, to collect information, to look at it analytically, and eventually use it for bettering their own lives. This is, or should be, the central objective of "education". Instead, we have didactic instruction, memorising by rote, and vomiting out useless information for futile examinations...

This theme of knowledge as weapon has come back to us many times in the last three decades. In the mid-80s, a small party from the Palamau district of Bihar knocked on our door. Could we come to their village and see what the proposed dam on the Auranga River was going to do to their area? We said yes, but provided they were able to wrangle a copy of the DPR (Detailed Project Report) of the dam. Oh, no problem, they remarked, the irrigation department chaprasi (peon) was from their village. So, three weeks later, we were rambling across the farmlands of Palamau inspecting the river and its catchment and comparing it to what was written in the DPR. We were faced with a battery of questions. Look at that river; exclaimed the villagers, do you think it can carry as much water as to irrigate all the lands the department is claiming it will? Can you see the silt in it; how long will it take for the dam to fill up? The dept says that this village will come under submergence, and that one will not, when we can clearly see that this village is higher than that one! How can we challenge their views?

When all these were factored into the calculations the benefits actually came to less than the costs! This was going to be one very unviable dam indeed, we informed the people. They, in turn, took the report and propagated it all over the area through posters and leaflets, while the English version was duly sent off to the govts, the media, the courts, & even the World Bank. Today, 15 years later, the Auranga River remains undammed.

We took four days to instruct a batch of 20 young boys from the surrounding villages how to measure the flow in the river, the silt load that it carried, and the slope of the land. With that, they said, they would be able to take on the project's claims of projected irrigation, the life of the dam, and the extent of submergence. On the last evening, as we were packing to leave the next morning, they eyed us suspiciously. Where, they asked, pointing to the "dumpy" (a kind of telescopic instrument that is used to measure levels), are you taking that? Well, we said, this is our instrument and we are taking it back; if you want one you will have to get it for yourselves. How much does it cost, they queried, and where is it available? The nearest place, we explained, would be Ranchi and it would cost about Rs 3000. And then we retired for the night. Only to be woken up by an exuberant hammering on the door very early the next morning. Here, they said, is Rs 3000 collected from donations by all the villagers, and you can go and buy the dumpy yourself; otherwise how will we fight a yuddh (war) without an astra (weapon)?

That the yuddh was joined became clear to us when, four months later, a parcel arrived with the postman. It contained a sheaf of papers containing the records of three months of daily measurement. We went to work on the data and came up with some very interesting findings indeed. The river, for instance, carried only half as much water in the monsoon months as the DPR claimed it did. This water also bore a silt load one-and-a-half times that of the figure reported in the project proposal. 25 villages were actually coming into the submergence zone, demarcated by following the full reservoir contour, as compared to the 19 acknowledged

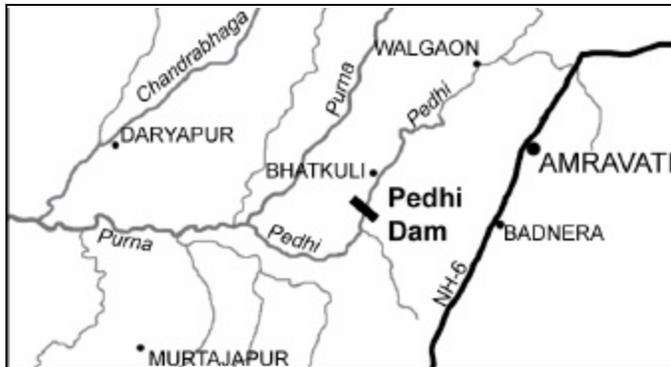
by the project authorities. When all these were factored into the calculations the benefits actually came to less than the costs! This was going to be one very unviable dam indeed, we informed the people of Auranga. They, in turn, took the report and propagated it all over the area through posters and leaflets, while the English version was duly sent off to the govts, the media, the courts, and even the World Bank. Today, 15

years later, the Auranga river remains undammed.

This much, then, is certain: people fight their struggles for survival based on what knowledge they can create. The report and the study cited above (and numerous others that have not been documented in both rural and urban areas) indicates that ordinary working people have the capacity to learn, to collect information, to look at it analytically, and eventually use it for bettering their own lives. This is, or should be, the central objective of "education". And yet, these are simple (and yet very complex) tasks that are not undertaken by our educational institutions. Didactic instruction, memorising by rote, and vomiting out useless information for futile examinations constitute the fundamentals of what passes for education in our schools and colleges. Perhaps there is a purpose to it all. Perhaps another Macaulay is required to explain it to us in yet another Minute. And perhaps, in some not too distant future, a group of young labourers will learn to document their own lives to tear this farce to pieces.

(A graduate (and post-graduate) from IIT Bombay, Dunu Roy heads Hazard Centre in New Delhi.)

Indefinite fast against the Pedhi dam



In a unique situation, the proposed Pedhi dam in Amravati district is being opposed by the people to be affected and also those who the project claims to benefit. For quite some time now the villagers of the command area of the project and would be affected people have raised voice against the project. According to them not only the project will displace

large number of people but also the conceived project is not feasible because of the high level of salinity in the proposed command area. "It will leave the land infertile", they argue. Over 40 women from affected families have resorted on fast since July 12 after the first phase when they had a sit in demonstration. Six women who are on indefinite fast have been shifted to Hospital in Nagpur after deterioration of their health. The women remained resolute even in the hospital.

Maharashtra govt plans to build a dam for medium irrigation project on the 70 km long Pedhi river (flows for 200 days a year) in Bhatkuli Tehsil (average rainfall 900 mm, with low variability and is not a drought prone tehsil) of Amravati district, Maharashtra. The Pedhi River, a tributary of Purna River, falls under Tapi River basin. According to the plan Rs 161 crore project is to provide irrigation to 10,192 ha spread across 45 villages, while a huge 2532 ha spread over 19 villages will be submerged due to the dam. Seven out of 19 villages will be submerged completely.

According to the Report of the Govt of Maharashtra's *Maharashtra Water and Irrigation Commission* Volume II (June 1999, page 216), the Pedhanadi project is to have a live storage capacity of 109 million cubic meters with gross irrigated area of 12770 ha.

Farmers say they don't require the dam, as even without it, they are able to irrigate their crops. "Today, the land is good and we get two crops without irrigation. But, we will

lose our land if the government acquires it for the dam. The initiative is not going to bear results," said Shrikant Khoregade, a farmer.

Strangely, the Aurangabad based Water and Land Management Institute and National Environmental Engineering Research Institute, Nagpur have given favourable reports on the project while the National Bureau of Soil Survey and Land Use Planning and Punjabrao Krishi Vidyapeeth, Akola have accepted it as a saline tract.

Vivekanand Mathane of Sarvodaya Mandal, leading the protests, has said that Purna river valley has been

When the Maharashtra Irrigation Commission has clearly stated that the area is not suitable for irrigation due to poor drainability and high retentivity of soils and saline groundwater, and when the commission has suggested weirs and farm ponds as better options, why is the state govt bent on going ahead with the project?

recognized as a saline tract where salinity and sodium content in ground water is very high and irrigation is difficult. After the govt had served land acquisition notices the villagers started agitation. Scores of farmers organised a bullock cart rally March 2007 to oppose land acquisition for the project.

Maharashtra Irrigation Commission Report (Vol II, p

203) concurs with this assessment, "the groundwater is predominantly saline with high percentage of salts... The saline water is not suitable for irrigation. In some areas the soils has become infertile due to use of such water." The report goes on to say (p 209), "The drainability of this soil is extremely poor due to the presence of sticky clay... the soil becomes waterlogged during high rainfall period... the soils in this sub basin which have high retentivity and low drainability." The commission report has included Bhatkuli tehsil among the saline tract tehsils of the sub basin.

In fact the Maharashtra Irrigation Commission Report provides a better alternative for the area, in terms of taking up construction of gated weirs along the rivers, which can hold 4-5 m water column to store the runoff from rainfall during the latter part of the monsoon and use that water to recharge the groundwater to make it less saline over time. The Commission report also suggests (p 211), "In each village it will be required to undertake construction of tanks in more number (at least one in each) for storing rain water... Large scale farm pond programme has a special significance for this saline zone..."

Meanwhile on July 25 the Chairman of Maharashtra Legislative Council asked the protesters to withdraw their agitation. Women protesters declined to accept the request and demanded that the project should be abandoned. (DNA 260707, <http://in.news.yahoo.com/090307>)

Swarup Bhattacharya & Himanshu Thakkar

A REGULATORY AUTHORITY FOR WATER?

Ramaswamy R. Iyer (From his speech at the PRAYAS /JNU National Consultation on Regulation (Electricity and Water) for the Poor, held in Delhi on July 12-13, '07)

At the outset, let me ask why electricity and water have been brought together in one meeting. They are very different from each other. At a pinch we can do without electricity, we won't die without it. In the absence of water, we will die. Water is a fundamental right, a human right; electricity is not on the same footing. Electricity and telecommunications are industrially produced supplies/services, but water is a natural resource.

In the telecommunications and electricity distribution areas, regulatory authorities came into being in the context of the privatization of these services. With privatization came the need to regulate the private service-providing parties, for the purpose of ensuring adequate and fair competition, reasonable tariffs and the protection of the consumers' interests. Against that background, any talk of regulatory authorities in relation to water has an ominous ring. Varying the metaphor, it seems to be the thin end of the wedge of privatization. If there is a case for the privatization of water services, then that case should not be taken for granted, but should be gone into and established first, before we start talking about a regulatory authority.

It may be argued that the case for a regulatory authority for water is independent of the case for the privatization of water services and does not presuppose the latter. The question then arises: what is to be regulated? With electricity or telecommunications the regulation is of the private corporate entities providing the service. With water, given the projection of a water crisis, what we need to regulate is the use of water.

Underlying the talk about regulatory authorities is the neo-liberal economist's view of water as an economic good or commodity subject to market forces; in that view, the principal instrument of regulation is market-led pricing aiming at 'full-cost recovery' limited only by competition. That is a seriously narrow and deficient view. The Maharashtra Water Resources Regulatory Authority is the outcome of this kind of thinking under the influence of the World Bank. Neo-liberal economics is not particularly concerned about the poor. That philosophy places its faith in the market; regulation takes place within the market; and the very poor are outside the market. To talk about regulation in the interest of the poor strikes me as ironic. It may be theoretically possible but seems very unlikely.

We need to understand water in all its complexities and dimensions. It is simultaneously an economic good or commodity, a social good, a fundamental or human right, an integral part of the ecological system, a part of culture and history, a sacred resource, and so on. It is also variously regarded as state property, private property, common property resource, etc. Corresponding to these divergent perceptions, there are divergent prescriptions

such as community management, water markets, state control, or public trust. We need to grapple with all these before we try to regulate water.

What do we mean by 'regulating' water? That in turn leads to the question of water policy, planning, management and conservation. That larger debate will point to the things that we need to do, the changes that we need to bring about, and these will include recommendations for appropriate institutional arrangements. We need to start from the water-policy end and proceed towards institutions. To talk about a regulatory authority first is to put the cart before the horse. It is a serious distraction from the issues that need to be discussed.

If we think that 'demand' is sacrosanct and that the essential thing to do is to make more water available for every kind of use, and if we think further that the responsibility for this can be shifted to private agencies or public-private partnerships, then it would of course be necessary to regulate the suppliers to ensure fair competition, good service and reasonable tariffs. On the other hand, if we think that the 'demand' for water cannot be allowed to grow unchecked but needs to be restrained, and that what is primarily called for is not supply-side augmentation but an acceptance of the finite nature of the supply in nature and the limiting of our draft on this scarce and precious natural resource through economical and equitable use and careful conservation, then 'regulation' takes on a different meaning.

Among other things we need to do the following: restrain the growth of demand; promote equity, efficiency and economy in water-use; foster a consciousness of a scarce and precious resource; promote rainwater-harvesting and micro-watershed development extensively; limit recourse to big projects to the minimum, treating them as projects of the last resort; arrest the present disastrous over-exploitation of groundwater; and arrest and reverse the loss of good water to pollution and contamination.

There may be disagreement about some of the objectives; and there may be disagreement about the means of achieving the objectives. We have to strive for a national consensus on what needs to be done about water, and that requires first a transformation of our thinking about water. We can then embody that understanding in appropriate institutions including not merely the governmental institutions but also the civil society. The MWRRA is essentially a bureaucracy with hardly any space for civil society. It does not strike me as embodying the right understanding, any more than the Central Groundwater Authority did. Fresh thinking is necessary, requiring both unlearning and learning.

Questions about the ADB's Flood Projects in North East India

In a significant development, the Asian Development Bank (ADB) has approved a Technical Assistance Project called "Northeastern Integrated Flood and Riverbank Erosion Management Project (Assam)" for USD 850 000 on Dec 15, 2006, to be completed by November 2007. This TA is expected to help prepare a USD 200 million loan project on the same issue. The consultants for its phase 1 were mobilized in the end of April 2007. The TA involves flood and riverbank erosion management sectoral review, strategy assessment, and options assessment of priority subprojects. In Phase 2 of the TA, feasibility studies of subprojects and institutional studies will be undertaken from October 2007 onwards.

This is the first ever ADB project on flood related issues in North East India and possibly for India itself. The ADB entry into this crucial issue needs to be watched with caution as it can have far reaching implications for a large number of people.

This is the first ever ADB project on flood related issues in North East India and possibly for India itself. The ADB entry into this crucial issue needs to be watched with caution as it can have far reaching implications for a large number of people. The World Bank is already trying to push a North East Water Regulatory Authority on the style of the Tennessee Valley Authority model. An earlier attempt to replicate the TVA model in India faced abject failure when the Damodar Valley Corporation was formed and projects were taken up in 1940s-50s.

Considering the significance of this project, SANDRP had asked ADB a few questions and then some further follow up questions and the resultant information is being published here.

The ADB is considering a similar TA for Arunachal Pradesh, which is under process for approval by Govt of India, after which the ADB will consider approval for it. The two TA outputs may be merged into one investment project covering the Brahmaputra basin in two states (excluding the Barak basin) that could be approved by end 2008/ early 2009.

The project would primarily comprise of a combination of structural and non-structural measures including (a) immediate flood protection and riverbank erosion mitigation for the urban and productive rural centers

(focusing on rehabilitation and upgrading of existing flood embankment systems in Assam and erosion mitigation threatening the townships and surrounding agriculture lands in Arunachal Pradesh), (b) a range of non-structure measures (flood and erosion forecasting and warning, flood plane zoning, disaster relief and management systems), and (c) institutional support for strengthening the management systems for flood and

riverbank erosion, including the support for longer-term planning and possibly inter-state cooperation between Arunachal Pradesh and Assam (e.g., sharing of flood forecasting and warning information, database on geomorphology, etc.) The work will be accompanied by a scientific component to develop a knowledge base

on the main processes affecting the Brahmaputra River and its tributaries.

Considering that Brahmaputra is an international basin (The Brahmaputra River is 2,880 kilometers (km) long and drains an area of 580,000 km², of which 51%, 8%, 34%, and 8%, respectively, are in the People's Republic of China, Bhutan, India, and Bangladesh. About 640 km with 70,600 km² of drainage area is in Assam), the project may have some support for facilitating the international cooperation such as holding seminars and promoting further information exchanges and dialogues. The TA will look into any possible implications for the ensuing investments in Assam and Arunachal Pradesh. In case of Arunachal Pradesh, impacts of upstream burst

of a landslide fill dam could be critical, calling for effective monitoring and warning system at the border point.

About the impact of the existing and under construction and planned dams and hydropower projects in India in the Brahmaputra, the ADB said, "This is also an issue to be looked into in the TA. However, the scope for

trapping flood water in the basin through those interventions (as compared with the amount of water passing through the Brahmaputra and its tributaries) appears rather limited, and we feel that it might be prudent to assume the flooding conditions without such interventions (although the measures to cope with

sudden release of water should be considered in the downstream impact areas). The impact on sedimentation and river erosion would require more careful analysis, but the geomorphological process is fairly complex and uncertain, against which the project would need to promote an adaptive approach to provide necessary riverbank protection works in critical reaches along the naturally developed bank lines through revetments and pro-siltation measures (rather than an interventionist approach to control, narrow, and train the river course through long spurs and guide bands). This approach should also be able to cope with any further changes caused by the above upstream interventions.”

Pro-siltation measures are means to slow down the river flow velocities (below the carrying capacity of sediment) and allow the river to deposit the sediment load. They are placed along bankline channels to promote silt deposition while reducing erosion of the riverbank. In Assam, porcupines – tetrahedron-shaped concrete frames of the height of about 3 m -- are being placed as pro-siltation measures, ADB added.

About the impact of global warming on the floods, the ADB stated, “This is also an issue to be looked into in the TA. At this stage we are in the process of collecting information, but available information indicates that the climate change may increase the flood discharges in association with the melting snow in the Himalayas, but may reduce over the longer run. There also appear conflicting anticipations on this aspect. We would consider what possible implications that may arise and should be incorporated during the life of the possible investments under the project.”

In response to SANDRP questions, ADB project in charge Kenichi Yokoyama stated, “As a matter of principle, we need to acknowledge that it is difficult to envisage permanent or very long-term solutions to address the flooding and riverbank erosion problems in the NE India, in view of the very dynamic geological, morphological, and hydrological conditions prevailing

there, as well as the limited knowledge base available at present. Within such dynamic environment, what we are pursuing is to assist the provision of coping measures (both structural and non-structural) that are deemed viable from economic, social, technical, and environmental perspectives in the next 40 years or so, under the present and foreseeable conditions within this time frame. The focus will be on high priority areas of the states (while taking steps towards developing a knowledge base to cope with such complex and uncertain environment). This also means that a next

generation of investment may have to be envisaged for the next time period, to further adapt to or respond to the dynamic conditions that might emerge and prevail at that time.” This means that ADB could fund further projects on flood issues in North East India.

One of the questions SANDRP had asked ADB

was, “how the past experience with embankments in North East will be an input into this programme and that embankments are essentially flood transfer mechanisms, they transfer the floods quickly to the downstream areas and as the ADB project is essentially

for providing structural measures for selected areas, such measures will have impact on downstream areas in terms of hastening the floods and increasing the flood vulnerability.” ADB response here did not address the issues raised, “The main purpose of the project in terms of flood management is to rehabilitate and upgrade (e.g., expanding the embankment width for higher stability including the placement of platforms to serve as flood shelters) the existing embankment systems that were

constructed in 1950-1960s, with a focus on those that have been protecting critical urban and productive rural areas (in Assam in particular) over the last several decades. Existing flood forecasting and warning systems are also built based on such infrastructure systems. Regarding the downstream implications of the project, at this moment the study envisages primarily assessing (incremental) impacts associated with rehabilitating the concerned existing embankment systems on the present

The Brahmaputra River is 2,880 km long and drains an area of 580,000 km², of which 51%, 8%, 34%, and 8%, respectively, are in the China, Bhutan, India, and Bangladesh. About 640 km with 70,600 km² of drainage area is in Assam

On the issue of embankments being flood transfer mechanism, increasing the vulnerability of the downstream areas, the ADB skirted the question, saying they will assume the existing embankment as given and will only incremental impact on the downstream areas, of strengthening the embankments. Similarly on the issue of past experience with the embankments, the ADB did not answer as to how that would be inform the new project.

hydrological conditions (taking the existing embankments as given), and taking any mitigation measures as necessary. At the same time, we would also pursue developing a sound knowledge base over the years, to be able to assess the overall hydrological implications of the embankment systems. Such knowledge base should also be able to provide a range of structural and nonstructural options and their combinations to further pursue effective passage of flood water in consultation with diverse stakeholders. (In this context, flood plain zoning to incorporate retention areas for flood storage while protecting most critical areas with structural embankments might be a longer term option.)”

On the issue of silt in the Brahmaputra and risk of sand casting when embankments breach, ADB said, “The Brahmaputra system carries a highly variable silt load, mainly influenced by landslides (and deforestation as well) in the watershed areas, to which riverbank erosion is also a major contributing factor. The present study is assessing the data on longer-term trend of bed level changes (which looks variable in different locations), with an intention to incorporate the future expected bed level changes in the design of the rehabilitated embankments so that they can withstand the same level of floods in response to changing riverbed conditions.”

On the issue of impact of large number of hydropower projects existing, under construction or planned, ADB said, “We agree that the implications of these upstream works would need to be incorporated in the structural and non-structural measures to be pursued under the proposed interventions. In this relation, we also need to note that storage dams would store the silt leading to reduced silt discharge in the downstream, which would be countered by the factors you have mentioned. We would also try to take into account the impacts of Lower Subansiri on the maximum flood discharges in the downstream areas.”

Regarding the glaciers melt due to global warming, also adding silt to the river, the ADB said, “This could also be a contributing factor, although the silt load from the

glacier areas appears to be a rather minor contributor at present, compared with the silt load originating from India.”

About the specific areas that are likely to be protected through the projects, ADB said, “At present, the study is looking into four areas in Assam, including:

- 40 km reach along Palashbari and Gumi areas (immediate downstream of Guwahati);
- 30 km reach surrounding the Dibrugarh town;
- 35 km reach from Bonkuwal to Difalupathar area

and a part of Kaziranga National Park; and

- 10 km reach along Matmara and adjoining areas (in Dhemaji district).”

“Although the state proposal comprises of flood embankment rehabilitation and riverbank protection works, the study is yet to specify which structural and nonstructural options would

be considered as options for the ensuing interventions. The specific proposals for Arunachal Pradesh, mainly comprising riverbank protection (and a small number of flood protection) schemes are to be provided by the state govt at the beginning of the separate study.”

ADB added, “What we mean is the economic life of the project for which the discounted present values of the project costs and project benefits are estimated and

compared to assess if the project is economically feasible. Following a general practice of project economic analysis, we might take about 6 years of implementation period, and additional 30-32 years as the period for which project benefits would be assessed. This would mean that the project would look at what might happen up to 36-38 years from now, incorporating any anticipated events and risks as much as possible. The possibility of

flood events beyond the design floods happening during this period would also be incorporated in the assessment as a risk to the anticipated benefit streams over the life span.”

Considering the implications of ADB proposals, we would like all concerned to let us know their comments on these and related issues. (<http://www.adb.org>, ADB correspondence with SANDRP)

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DAMS**Dams, Politics and Culture**

It is well known that Rivers have great cultural and religious significance for the people in India. However, the politicians over the years have been trying to bring big dams and big reservoirs also into the cultural and religious agenda of the people. We give some examples from some such attempts.

Karnataka On July 20, the Karnataka Chief Minister and his wife offered “bagina” to the Krishna Raj Sagar Dam on Cauvery, when the dam got filled to the brim. Each year that the dam fills to the brim, it has become a custom for the Chief Minister to offer such prayers.

Tamil Nadu On July 20, the Union Minister of State for Finance SS Palanimanickam pushed a button to open the sluices of the Mettur dam on Cauvery River in Tamil Nadu, signaling release of water from the dam for irrigation in Cauvery, Vennar, Grand Anicut and Coleroon canals. State ministers and all levels of engineers were present on the occasion. Earlier farmers carried plates filled with paddy seeds in procession offered prayers at temples located at the dam site, accompanied by beating of drums. Farmers later sprinkled paddy seeds and flower petals in the river water.

Andhra Pradesh The Chief Minister of the state, accompanied by other ministers and officials in helicopter, landed at the Jurala dam on July 21 to signal release of water from the about 40 of the total 60 sluices of the under construction Jurala dam in Krishna basin. His statement was cryptic, “Our projects are happy. God is happy. People are happy. Politicians are happy.”

The CM of AP, in an effort to win next state elections, has decided to conduct state and party functions at the sites of ongoing irrigation projects during the run up to the next polls.

Kutch, Gujarat On July 16, Bhuj Mayor organised the Meghotsav (thanksgiving ceremony for good rainfall) celebrations at the historic Hamirsar lake, spread over 22 acres, on Kutchi New Year Day. The celebrations take place only after the 450-year-old lake overflows and considering the scanty rainfall the region receives, it is a rare occurrence. For, since 1953, only 16 mayors have had the opportunity to see an overflowing lake. The importance of the lake could be gauged from the fact that the district administration has been specially empowered to declare holiday on the day it starts overflowing. In the erstwhile princely state of Bhuj, the puja included throwing a bag of gold coins, a chundadi (red cloth) and coconuts into the lake to be picked by local swimmers. The ceremony was taken care of by municipal presidents of Bhuj civic body after Independence. (Indian Express 190707, Deccan Herald 210707, Deccan Chronicle 050707, 220707, The Statesman 220707)

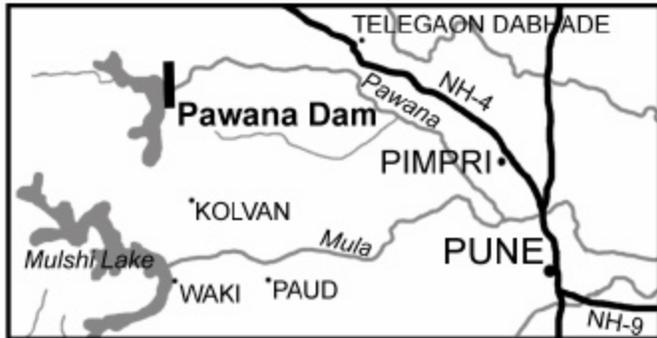
Tehri PAF land with builder lobby The Rehabilitation Director and Tehri District Magistrate has ordered registering of cases against a former executive engineer, deputy revenue officer and others for being part of a conspiracy to sell off the land meant for the project affected persons to the builder lobby. This has been done following enquiries by the Assistant district magistrate and police officials and a report by the retired district judge in the grievance Redressal cell. It was found that in Haridwar district land meant for the affected people was given in the name of fictitious people, which landed into the hands of the builders. (*Hindustan* 020807)

Sujalam Sufalam scam in Gujarat A lot came to light when poorly constructed checkdams under the Sujalam Sufalam scheme got washed away or simply collapsed last monsoon. It was noticed that the Water Resources wing of Narmada, Water Resources, Water Supply and Kalpasar Department of Gujarat govt were quick to adjust the loss of Rs 45 crores in the Calamity Relief Fund. Moreover, about Rs 668 crores worth of contracts for earthwork under the Sujalam Sufalam scheme were given to a group of just 8 contractors, ignoring all rules and regulations of the tendering process, while the department showed on paper that 72 agencies were involved. The Public Accounts Committee in its report that is not being tabled in the Gujarat Assembly by the state government, scrutinised the accounts and audit report of the Water Resources wing of Narmada, Water Resources, Water Supply and Kalpasar Department since 1993-94. The committee accused the department of embezzlement, illegally awarding contracts, misuse of government funds and poor quality construction under the Sujalam Sufalam scheme. The 10th report of Public Account Committee (2005-2006) formerly headed by Chandrika Chudasma and now by Punjabhai Vansh, calls for investigating the tendering process while recommending action against the former Water Resources Secretary M S Patel. A pet project of Chief Minister Narendra Modi, the Rs 3,000 crore scheme envisaged to improve the water situation in 10 dry districts facing depleted groundwater levels. The scheme was also supposed to provide employment to farmers as checkdams, ponds and earthwork was supposed to be done with public participation. Mehsana, Patan, Gandhinagar, Banaskantha, Sabarkantha, Ahmedabad, Panchmahals, Dahod, Kutch and Surendranagar districts were involved in the yojna. The scheme is divided into three broad categories:

1) Scheme for Mehsana, Patan, Gandhinagar, Banaskantha, Sabarkantha and Ahmedabad: A 280 -km-long canal network to link Kadana Dam with Banas River; along the way 21 dry rivers and several ponds will be revived. At least nine reservoirs, which usually have below 50 % capacity water would be linked by canals to the Narmada Main Canal and would be filled up. 2) Farm pond scheme: Under this 1 lakh farm ponds would be dug 3) Saurashtra Area. (Indian Express 210707)

The Curious Case of Bachchan Land Episode**The Prosperous grab displaced farmers' land**

The curious case of Mr Amitabh Bachchan first buying the land acquired from the dam displaced and then making an attempt to donate that land reveals a lot about how the Indian state and society treats its people. The case may seem like being full of a lot of symbolism, but the symbolisms are all bursting with very significant substance and raise many questions.



The land in question, at Pol in Maval Taluka in Pune district in Maharashtra was forcibly acquired from the farmers for the Pawana Dam. The Pawana dam has been built on Pawana River in Upper Bhima basin (tributary of Krishna Basin). The construction was completed in 1972, so the land must have been acquired in 1960s.

The controversial piece of land was purchased in the name of Amitabh and his son Abhishek Bachchan in the year 2000. However, as per section 63 of the Bombay Tenancy and Agricultural Lands Act 1948, no person can purchase agricultural land in Maharashtra if he is not a farmer. To fulfill this requirement, Mr Bachchan had submitted the certificate that he was a farmer and was in possession of land at Barabanki district in Uttar Pradesh since January 11, 1983. The Pune district collector had ordered an inquiry into the land purchase following reports in April 2005 when villagers objecting to the purchase. In March 2006 the Pune Collector had written to the Barabanki District Magistrate for authentication of Bachchan's testimonial.

On March 24, 2006, the then district magistrate of Barabanki had cancelled the allotment of three bighas of gram sabha land in Daulatpur village of Barabanki district in Uttar Pradesh to Mr Bachchan on the ground that the entries passed in the revenue record regarding the allotment appeared forged. Also, there was no information regarding the change in allotment in the files available with the record room of the revenue dept. It was also revealed that the records had no document whatsoever, which could explain the basis on which the entries regarding the allotment of land to Bachchan were made. Mr Bachchan's lawyer filed a review petition

against this order to seek cancellation of the order of March 24, 2006.

Faizabad district court of Uttar Pradesh on 1st June, 2007 court upheld the cancellation land allotted to Mr Bachchan in Barabanki. Faizabad additional commissioner ruled that entry in the land records declaring Mr Bachchan as the owner of the particular plot of land was "tampered and forged".

On July 19 2007, the Maharashtra Revenue Minister said that Pune Divisional Commissioner had received a letter from Mr Bachchan, stating that he wanted to return the land in Pune District without any remuneration. This seemed like an attempt of King Akbar that was described by Birbal as *bund se gai so hoj se...* The only difference being that in this case the *hoj* seems smaller than the *bund*.

The Dam Affected The Representative of Maval Taluka Dam-affected Farmers Association Mr Baba Adhav said that there are 832 farmers affected by the Pawana dam who have not got alternative land. He also demanded that the 327 acres of acquired land left unused after construction of the dam should be returned to the farmers concerned. The Association has demanded a probe through a judicial commission in these deals as many film stars and other non-farmers have bought huge land plots in Maval taluka. The Pawana backwaters right up to Lonavala has been attracting film stars because of the scenic beauty and close proximity to the Pune-Mumbai expressway.

The Questions Many questions arise from this sequence of events, some of the important ones being:

- Why was more land than what was required for the dam acquired from the farmers?
- At the end of the construction, if it was realised that there was excess land, why was it not returned to the affected farmers?
- How can the state justify selling of such land that was forcibly acquired in the name of public purpose? The land was sold at cheap (compared to market rates) to film stars and such others, how can that be justified?
- How can film stars and such others, knowing that the land has been forcibly acquired after displacing farmers, buy such land?
- Why did the Maharashtra govt not check the authenticity of claims of Mr Bachchan and others when they bought the Pawana dam land? Particularly when it is clear that these luminaries are not farmers by any stretch of wildest Hindi film imagination?
- What respect society can have for those indulging in such mal practices?

It is not easy to find answers most of these questions.

The dismal Performance of the Pawana Dam

The Pawana dam that now falls under the administration of the Maharashtra Krishna Valley Development Corp (MKVDC) has been built for the purpose of drinking water supply, hydropower and irrigation.

Pawana Dam: Salient Features

Completion year	1972
River	Pawana
Dist	Pune
Type	Eath/Gravity/Masonry
Height (m)	42.37
Length (m)	1329
Gross storage (1000 m ³)	305000
Live Storage (1000 m ³)	274000
Reservoir Area (Ha)	2365
Purpose	Hydro/Water Supply
Installed Hydropower Capacity	10 MW

Source: Central Water Commission, 2001, Register of Indian Dams

The designed live storage capacity of the dam was 274 MCM, which now seems to have come down to 241 MCM, as per the website of the Maharashtra Govt's Irrigation Department. This is a reduction of over 12%.

The project supplies 228 MLD drinking water in Ravet village through an open canal for Pimpri-Chinchawad Municipal Corp (PCMC) in Pune district. The MKVDC had proposed to increase the height of the dam in the year 2001. The MKVDC had assured to supply additional 100 MLD water to PCMC, over and above the current daily quota of 228 MLD, if the PCMC issues a grant of Rs 12 crore towards increasing the height of Pawana dam. The PCMC needs the additional quota of 100 MLD as it will help it to cater to the drinking water needs of the 18 fringe villages that had been merged in its limits. Also, the PCMC was not inclined to execute the Rs 64.5 crore pipeline project as the MKVDC had refused to reduce the raw water charges.

The figures giving the last three-year performance of the project is are given below.

Performance of the Pawana Dam

	2003-04	2004-05	2005-06	2006-07	
Live Storage (15 Oct) (MCM)	232.54	230.57	235.68	241	
Water Use (MCM)	Irrigation	23.91	25.64	21.99	NA
	Non Irrigation	168.32	140.01	136.1	NA
	Total	192.23	165.65	158.09	NA
Evaporation (MCM)	15.72	23.31	17.55	NA	
Hydropower generation (MU)	10	8	13.51	18.4	

MCM: Million Cubic Meters; MU: Million Units; NA: Not available

According to the figures from the Water Audit report of Maharashtra, the dam was filled upto an average level of

85% and maximum level of 86% of the live storage capacity during 2003-04 to 2005-06. This signified under utilisation of the live storage capacity of the dam. In spite of this situation, MKVDC has proposed increasing the height of the dam, which is difficult to justify when even the current capacity does not get filled up. The total water utilisation from the actual live storage was 82.67%, 70% and 67.08% in 2003-4, 2004-5 and 2005-6 respectively. This means that at least 17%, 30% & 33% of the stored water could not be utilised. This raises further doubts about justification for increasing the height of the dam when the existing storage is not utilised.

The Power generation at Pawana, starting from 1990-91 to 2006-7, have been, 9, 8, 9, 0, 0, 10, 7, 14, 18, 11, 8, 6, 14, 10, 8, 13.51 and 18.4 MU respectively. This comes to an average of 0.97 MU per MW installed capacity for Pawana Dam over these 17 years for which we could get figures. It means that the hydropower component has a load factor of just 11%. It is clear from these figures that Power generation at Pawana dam has been

much below the potential for which the dam was constructed.

Out of the 6365 ha of irrigation potential created by the dam, the project on an average could irrigate 2994 ha (47%) in the five years ending in 2002-3 and 3083 ha in 2003-4 (48.4%). This shows that the project performance on irrigation front is quite poor. And yet upto 32% of the water stored in the dam remained unutilized during 2003-4 to 2005-6.

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The Maharashtra govt takes pride in the fact that it has been able to publish the Water Audit and Irrigation Performance Benchmarking reports. However, a review of the last three years reports shows that the information given in these report is very inconsistency, making it difficult to either check inconsistencies or to analyse the performance of projects. To give an example, the benchmarking reports in 2004-05 and 2005-06 do not give the area irrigated by Pawana dam! Similarly the water audit reports do not give the figures of how much water was utilised from Pawana dam for irrigation, water supply and what are the loss figures.

If we look at the Krishna Valley Dams during these 17 years, the generation has been 2.74 MU per MW installed capacity. It is clear from this that even in comparison with hydropower projects in Krishna Basin, Pawana dam has been performing far below its potential. (The Times of India 020607, 230707, UNI 190707, Zeenews, Outlookindia.com, Report on Water Audit of irrigation Projects in Maharashtra, WRD Maharashtra – 2003-04, 2004-05, 2005-06, www.cea.nic.in)

Bipin Chandra and Himanshu Thakkar

HYDRO PROJECTS

Poor HEP performance India's installed capacity of hydropower projects rose to 32593.15 MW as on March 31, 2007 (www.cea.nic.in) but the generation performance of the projects remained poor at 3.29 million units per MW installed capacity during 2006-07.

HC: No mining of sand & aggregates in Kulu district

The Himachal Pradesh High Court has ordered that there will be no mining for sand and aggregates in Kulu district for the mega projects under construction in the district. This is following a PIL that such mining is leading to damage to environment on big scale, in addition to the environmental damage that the projects themselves do. The damages is also leading to disastrous floods in the Beas river, the petition has pleaded. The HC has issued directions to the state govt in this regard and asked the Kulu district collector and Superintendent of Police to ensure its implementation. (Divya Himachal 270707)

Chhatru HEP to DCM The HP govt has given the Rs 700 crores, 108 MW Chhatru HEP on Chandra River in Himachal Pradesh to DCM Shriram Consolidated Ltd on BOOT basis. The project involves a 19-metre high barrage. (The Tribune 020807)

CDM PROJECTS

Bhoruka project commissioned The 24 MW Chayadevi HEP of Bhoruka Power Corp Limited, in Gulbarga district in Karnataka has been commissioned. The Rs 80 crore project in Krishna River Basin has gone through the validation process as UNFCCC's CDM project. (Financial Express 010807)

Velcan Projects Velcan Energy (active in HEPs in Brazil) has recently become active in hydro projects in India. Recently, two of its wholly owned subsidiaries were each granted a 30-year concession to develop a 25MW project in Orissa state. The Bhimkund and Tarini HEPs will be built on the 'Baitarani' river, to be built over 2009-2011. They would be built 5 km apart they will be operated as a single scheme. The HEPs are expected to generate up to 200GWh per year, and secure 210,000 Certified Emission Reduction credits per annum. (WaterPower Magazine 180707)

Sweden Policy Sweden will not purchase carbon quotas that are generated by CDM projects when those projects have in earlier phases received Swedish aid funding, so that there is no perverse incentive.

- **Denmark Policy** The Danish practice is to strategically link aid financing for the development of CDM projects with Denmark's carbon quota shopping.
- **Norway Policy** The new govt policy allows the Norway govt to issue guarantees for the purchase of carbon quotas from the CDM projects in the developing countries. Norway Development Minister hopes that this will give a new boost to hydropower financing in Africa and promised more funds for the same. (Development Today 290507)

NHPC's Poor Track Record

NHPC violates FCA, EPA in Sikkim: Ordered to "clean up the place" The Central Empowered Committee appointed by the Supreme Court has ordered the National Hydro Power Corp to, "clean up the place". The NHPC advocate assured that this will be done. This was following an application by Shiba Sunawar, Jalpaiguri (Sikkim) regarding direction against NHPC for willful violation of the Forest (Conservation) Act, 1980 and Environment (Protection) Act, 1986 during the implementation of the Teesta V Project. The advocate for National Hydro Power Corporation (NHPC) submitted an affidavit at the time of the hearing. Stating that most of the muck has been removed by NHPC and other corrective measures are being undertaken to remove it from river and forests. The CEC observed that the matter also refers to land meant for one purpose has been used for some other purpose. The advocate for the applicant stated that they he will verify the NHPC affidavit based on ground situation and then respond. (Forest Case Update May 2007)

Cheating of Parvati-2 affected in HP: Only 3 PAFs given job

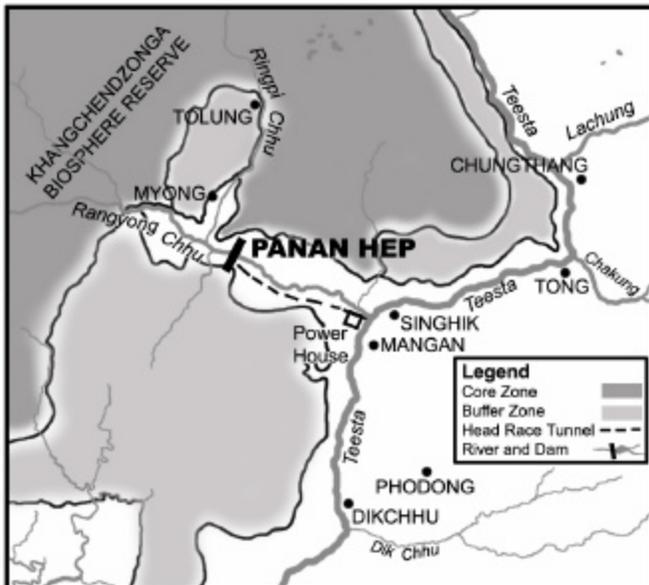
The National Hydroelectric Power Corporation Ltd has cheated the 66 project affected families of the under construction Parvati-2 hydropower project in Beas River basin in Kulu district in Himachal Pradesh. The PAFs gave up their land on the promise that a member of each of the family will get employment at the project. 16 of the families became landless. Himachal Pradesh govt also has a policy that at least 70% of the grade III and IV vacancies must be filled from state people. The project is now in 9th year of its work. Cheating the affected people and violating the state policies, so far NHPC has given jobs to only 3 affected persons. The rest of the 63 families have been going from pillar to post, without success. The state government also seems hand in glove with the project authorities and it has taken no effective steps to ensure that affected people get the promised jobs. (Divya Himachal 140707)

Damages at Teesta "Low" Dam sites in Bengal The floods in Teesta river lead to serious damage at the under construction Teesta "Low" Dam Projects III and IV of the NHPC in Jalpaiguri district in Northern part of W Bengal. The rains led to suspension of work of the NHPC's third phase Teesta low dam project at Rambhi in Kalimpong. Equipment, machinery and materials worth Rs 160 crore was affected, NHPC Chief Engineer said. The project work would resume only after water level of Teesta dropped to normal. (NESPON, Hindu 290707)

Public hearing without information! The Matu organisation has written to the Union Ministry of Environment and Forests that the public hearing for the 530 MW Kotli Bhel 2 HEP held on June 27 and 28 was in violation of the norms and right of the affected people as they did not have access to the EIA and EMP of the project. (Matu 280707)

Lepcha Protests against Panan HEP in Sikkim

The Sikkim govt has said that the 280 MW Panan HEP in the protected Lepcha reserve of Dzongu in North Sikkim did not pose a threat to the ecology and culture of the area and that the Union Ministry of Environment and Forest has barred the developers of the project from setting up any labour colony within the Dzongu region. However, the govt statements were ineffective and the protest fast by the affected people continued beyond 44 days. A number of organisations including Delhi Forum, Kalpavriksh, SANDRP and others wrote to the Prime Minister and the President of India, without any response, so far.



Meanwhile on July 18 the Supreme Court's Central Empowered Committee asked the Sikkim government to respond to the issues raised by the Lepcha community. The Affected Citizens of Teesta had approached the committee stating that part of the Panan project would affect the Khangchendzonga National Park.

The Sikkim Pollution Control Board listed the project as a 300 MW project for which public hearing was conducted on Sept 18, 2006. The project is to be developed by the Hyderabad based company Himagiri Hydro Energy Pvt. Ltd. However, in June 2007, the website said the project will have a capacity of 200 MW. The Report (Dec 2006) on the Carrying Capacity Study of the Teesta Basin in Sikkim, by the Centre for Inter-Disciplinary Studies of Mountain and Hill Environment, Delhi University also mentioned the project as a 200 MW one. It is not clear how the project installed capacity was increased to 280 MW and then to 300 MW.

The project was cleared by the Ministry of Environment and Forests on Jan 2, 2007 as a 280 MW project. The clearance letter stated that the project in the North

Sikkim district involves a 56 m high concrete gravity dam about 1.75 km downstream of the confluence of the Rangyong Chhu and RInipi Chhu, near Linigaza village in Mangan Subdivision on the Rangyong Chhu (also called Tolung Chhu), a tributary of Teesta. The project requires 56.835 ha of land, including 23.629 ha of forest land. The clearance letter says, "The surface power stations would be located on the right bank of the Tolung Chhu river", but this seems to be a mistake, for according to the CISMHE report, an underground power house is to be located on the right bank of the Teesta river at the confluence of Tolung Chhu and Teesta River, near Panan Town and that the project involves a 9 km long head race tunnel. The Rs 1375.66 crore project will displace 116 families, rendering 9 families landless. The clearance letter stats, "The Dzongu region is provided with special status under Article 371 (F) of Indian Constitution for preserving the Lepcha culture. Labour colony as well as staff colony should not be set up within the Dzongu region." How this will be possible, considering that the project is coming up inside the Dzongu region is difficult to understand.

The clearance letter says, "Total 4005 ha of very severe & severe degraded catchment area has been identified and proposed for treatment in four years for checking the siltation." This includes carrying out Catchment Area Treatment works inside the Khangchendzonga Biosphere Reserve, 2442.5 ha in Core Zone- 1 (Khangchendzonga National Park) and 1562.5 ha in the Buffer Zones – III and IV of the KBR. The CAT works include activities such as construction of brush wood check dams, DRSM check dams, crate wire check dams, bench terracing and afforestation. These activities will involve considerable procurement of material (stone, brushwood, poles etc.) as well as alteration of landscape and wildlife habitat (terracing, contour trenching, fencing off areas for afforestation) inside the Biosphere Reserve, including the Core Zone – the KNP. The 2000 notification of the Khangchendzonga Biosphere Reserve by the MoEF clearly states that "the Core Zone of the Biosphere Reserve will be kept absolutely undisturbed".

The Hon'ble Supreme Court in its order dated 14-02-2000 in T.N. Godavarman v. Union of India WP (C) 202 of 1995 held, "in the mean time, we restrain respondents No.2 to 32 from ordering the removal of dead, diseased, dying, or wind fallen trees, drift wood and grasses etc from any national park or game sanctuary or forest."

The ACT application highlighted that the proposed CAT activities inside the protected area is in complete violation of the above mentioned order and hence clearance to the HEP should be cancelled. The CEC has issued notice to the Sikkim government in this regard. (Assam Tribune 050707, DTE 150807, Forest Case Update 36)

Continued from p 1

In Rajasthan itself, to strengthen the dam safety activities, a project "Dam Safety Assurance and Rehabilitation" was commenced in 1991 with loan from World Bank. An expenditure of Rs 109.68 crore was incurred. Unfortunately, what the project has left behind is a legacy of debt, unused infrastructure and unsafe dams.

To illustrate, the State Dam Safety Committee suggested (in November 1996 when the World Bank funded project was still on) removal of defects in the Jaswant Sagar Dam, viz. erosion of down stream area, signs of abrasion and cavitations etc. developed in the dam. The Comptroller and Auditor General report for Rajasthan in 2001 noted, "Instead of removing these defects, department incurred expenditure of Rs 27.61 lakh on 6 works viz.; renovation of existing road in bituminous road (Rs 9.88 lakh), construction of foot bridge on overflow (Rs 7.19 lakh), providing sodium lights (Rs 4.06 lakh), purchase of generating set and diesel engine (Rs 1.25 lakh), purchase of wooden planks (Rs 4.50 lakh) and other petty items (Rs 0.73 lakh) under basic safety facilities component of Dam Safety Project. These works did not increase the utility of the dam and resulted in avoidable expenditure out of interest bearing loan assistance funds of World Bank." The results are in front of us.

Rajasthan govt also had the advantage of satellite based information system that showed that the catchment area of the 12 km long dam with storage capacity of 40.83 million cubic meters was getting heavy rains. The govt officials and ministers also knew that for many years the dam has not been filled to capacity, so when so much water would come to the dam, there was every possibility of dam giving way. Particularly when the govt had not implemented the measures required for safety of the dam. The dam has had history of cracking up in the past (for example, in 1979 and earlier) when it experienced heavy inflows. But neither the Rajasthan govt, nor the Central Water Commission (who also has the resources, mandate and duty for flood forecasting) do anything to avert this avoidable disaster.

This was the repeat of the last year's flood event in Rajasthan that lead to death of scores of people and destruction of property and livelihoods. That disaster

could also have been predicted with the use of advance information about the rainfall that is now available with the govts.

Government of India's apex organisation on water resources, namely Central Water Commission, is supposed to be responsible for, among other things, guiding states on safety of major and medium projects of the country. Its tasks include, "To conduct studies on dam safety aspects for the existing and future dams and standardize the instruments for dam safety measures". Govt of India constituted the National Committee on Dam Safety in Oct 1987. The report of the working group on water

resources development for the 11th Five year Plan says, "Although dam safety procedures are more or less well defined, there is no dam safety legislation." What is one to understand from this? Is the dam safety procedure *more* defined or *less* defined? Is the *definition of the procedure* good enough for dam safety? The report proposes an allocation of whopping Rs 2010 crores for dam safety (though allocation for Rajasthan is scandalously, nil), but will such funds be of any help for the unaccountable water resources establishment? The

past performance of the CWC, if we look at the implementation of the World Bank funded project, is dismal.

The only way out, if we really want to avoid more of such disasters in future, is to have clearly defined, publicly known norms of institutional and individual accountability for such serious lapses.

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Government of India's apex organisation on water resources, namely Central Water Commission, is supposed to be responsible for, among other things, guiding states on safety of major and medium projects of the country. However, its track record is dismal if we look at the past. It has been a brazen participant of the dam disasters unfolding in India.

When last heard, the Rajasthan govt had set up a committee to enquire into the reasons for the Jaswant Sagar Dam collapse, the report was supposed to be submitted in 15 days, but a month after, it is known as yet if the report has submitted. In any case the report is not in public domain. The dam authorities started repair work at the dam soon after the floods subsided.

When a Dam Collapses in US Let us compare what happened at Jaswant Sagar Dam collapse with the sequence of events when a dam collapsed recently in the United States.

On Dec 14, 2005, the upper reservoir of the 470 MW Taum Sauk hydroelectric project (upper reservoir of the pump storage project) in Reynolds County, Missouri

breached (the breach was about 600 feet wide), in somewhat similar fashion as did the Jaswant Sagar Dam, releasing 5.24 MCM of water in 20 minutes. The quantity of the water released at the US dam was less than a 13% of the water released at the Jaswant Sagar Dam (40.83 MCM), though the water release from the Taum Sauk dam was certainly faster.

On Dec 21, '05, the Federal Electricity Regulatory Commission of USA (www.ferc.gov) made a public statement through press release that FERC has launched an investigation into the

breach. The Commission dispatched a team of five engineers to the Taum Sauk facility immediately after the breach. Immediately following the Taum Sauk breach of the upper reservoir, the Commission initiated a review of all Commission-regulated pump storage projects to assure project safety and determine the need for, and development of guidelines for the safe operation of pump storage projects. "The Commission's hydropower safety program is a model for the world. To the extent this unfortunate event provides lessons we can apply to the program, we will make it even better," FERC Chairman said.

The responsible company AmerenUE was asked by the FERC to submit a report prepared by an independent consultant retained by the company. The company submitted a report on April 7, '06, which was in public domain. The Commission's dam safety staff conducted an exhaustive forensic investigation of the breach, which is detailed in a report released on April 28, '06.

A report by a team of independent experts assembled by the Commission was released on May 25, '06. The report was open for public comment till June 26, '06. on July 20, '06, the FERC made public all the submissions received during the comment period.

The FERC held the company responsible for 15 violations of various Commission regulations and license conditions, including failure to notify the Commission of conditions affecting the safety of the project and failure to use sound and prudent engineering practices. The FERC imposed a civil penalty of \$10 million, the largest

the Commission has ever imposed in a hydroelectric matter. In addition, the responsible company AmerenUE was asked to spend \$5 million in improvements, over and above the costs AmerenUE will incur in remedying the environmental and property damage caused by the breach. On Oct 2, '06, the FERC announced that the company has agreed to pay the penalties mentioned

above. On April 10, '07, the FERC approved the USD 5 million plan for dam safety enhancement and other improvements and the plan was also made public.

The company had to submit a draft Environment Impact

Assessment before under taking the repair work, even though the new dam was to be of the same size and area as the old dam. The company made the application to FERC for the new dam on Feb 5, '07 and filed a supplementary report in May '07, as demanded by FERC. Based on our review of the licensee's application

FERC issued a public notice on Feb 13, '07 of intent to prepare an environmental document. On Feb 21, '07, the Commission issued a Scoping Document that advised all participants as to the proposed scope of the environmental document and to seek additional information pertinent to the analysis of the rebuilding proposal. The Commission conducted two public scoping meetings on March 12, '07, to identify issues and concerns surrounding the rebuilding of the upper reservoir.

The FERC staff went through the draft EIA and

made their own comments, and demanded additional steps which were accompanied by the publication of draft EIA on July 9, '07 for public comment. American Rivers, in its submission in response, opposed rebuilding of the dam, saying that since the facility was to come up for relicensing in 2010, the decision should not be limited to only current rebuilding, but whether to rebuild at all, that is include the decision if the project should get the license in 2010. The FERC will take a final decision after the comment period is over.

It is worth noting here that none of this happened at the Jaswant Sagar Dam breach in Rajasthan. Is there something we in India can learn from this case study of the Taum Sauk Dam breach in US ?

The only way out, if we really want to avoid more of such disasters in future, is to have clearly defined, publicly known norms of institutional and individual accountability for such serious lapses.

At a similar dam breach in US, three separate enquiry reports were made and put in public domain. The Company has held responsible for negligence on 15 counts and the company was asked to pay a fine of USD 10 million and spend USD 5 million on dam improvements, in addition to paying for the damages caused due to the breach. Before taking up the repair work, an EIA had to be done and put in public domain a month before the public hearing. Remember none of this happened at the Jaswant Sagar Dam break in Rajasthan.

Himanshu Thakkar

NHPC TRACK RECORD**Dam builders blind to geo-hydrological risks**

On July 27, torrential rains in Jalpaiguri district in North Bengal damaged two under construction dams (Teesta Low dam Project (TLDP) III and IV) on Teesta River being built by National Hydroelectric Power Corp (NHPC). The incident has once again put the utterly poor track record of NHPC in terms of taking care of geological & hydrological risks under scanner.

For this was not the first such incident. Earlier on July 17, a minor breach in embankment at nearby Kalijhora had swept away machineries, and should have alerted NHPC. Last year on June 25, a temporary Bailey bridge had collapsed at TLDP III HEP site near Rambhi. Seven workers had died and 17 were feared dead due to that accident. This recent disaster shows that NHPC has been following its policy of sailing sans social responsibility that has time and again put the lives of workers and adjacent population in danger by continuing to carry out the dam construction work during monsoon, while paying no heed to geological & hydrological risks.

An environmental organisation North East Society for Protection Of Nature (NESPON) from Siliguri carried out a fact finding at both the sites – TLDP III near Rambhi in Kalimpong sub division and TLDP IV near Kalijhora – on July 29, and found that NHPC had failed to address geological concerns and had not carried out any slope protective measures along the reservoir rim. Soumitra Ghosh of NESPON says, "Construction was started by NHPC at TLDP III near Rambhi since 2004, and at TLDP IV near Kalijhora since 2006 and all through out we witnessed rampant use of dynamite, fast denudation of existing vegetation cover at slopes on both the banks of river, while no protection activity was undertaken along the reservoir rim or potential slide zones. When a large part of NH 31 road side caved in during August 2006, opening a new slide just above TLDP III site, NHPC responded by shoddily erecting a guard wall at that particular site. Although, the environment clearance granted to the projects is based on Environmental Impact Assessment and Environmental Management Plan that talk about giving priority to catchment protection work given the high siltation, NHPC has just concentrated on dam construction while nothing has been done for catchment protection."

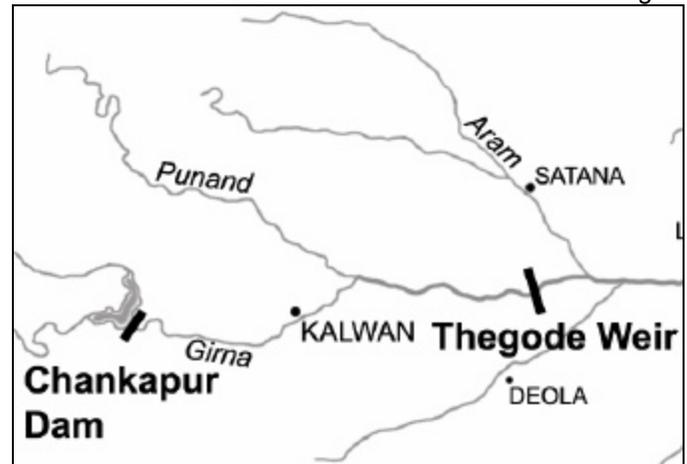
NESPON's fact-finding team also came across 14 new landslides between these two dam sites and increasing erosion on Left bank near Mongpong. The Irrigation

Department Spur on the right bank is breached affecting Chumukdangi village in a very bad way.

In one of the worst incidences of its kind, the evening of April 7, 2005 witnessed a tragedy in the downstream of the controversial Indira (Narmada) Sagar Dam in Madhya Pradesh. More than 65 Hindu pilgrims were

killed by the torrential waters that came gushing down when project authorities opened water channel gates. Again there was no warning to downstream people. The banks of the holy river were crowded by devotees that day for a festival. Water levels rose to five feet in a matter of minutes when

NHDC (Narmada Hydro-electric Development Corp, a joint venture between Madhya Pradesh govt and NHPC) suddenly released water from the dam without warning. Even as dead bodies were being removed, the NHDC officers were busy addressing a couple of press conferences in the state capital denying responsibility. A BBC news story quoted the NHDC chief S K Dodeja, as denying any negligence on the part of the NHDC "It was the district administration's job to warn the pilgrims and the NHDC of the crowds congregating on the banks of the Narmada. Lack of coordination between the local authorities and NHDC had led to the misunderstanding".



As we write this, news is coming that a similar incident occurred in Deola tehsil in Nashik district (see the map above) in Maharashtra on Aug 5, '07 when due to sudden release of large quantity water from the Chankapur dam (742 cusecs) and from Thengade weir (8,313 cusecs) into river Girna river (a tributary of Tapi River) lead to washing away of four persons, including

three children. The district magistrate, as usual, claimed that it was routine release and did not require warning.

Within a week after Dharaji incident, on April 14 '05, two workers were buried alive under the debris while they were working inside a tunnel at NHPC's Parbati HEP near Kullu in Himachal Pradesh. This was the third accident within a span of four months since Jan 7 '05 when a migrant worker from Madhya Pradesh was buried alive while working inside the tunnel. Two weeks later, three workers including one engineer were buried alive in this tunnel. In Nov '03 also, four persons were buried alive at Parbati HEP site, when the hill under which they were working caved in.

For the last three years, Parbati HEP has repeatedly been hit by such disasters. In 2003, during monsoon when a cloudburst happened in a village in the Kullu valley, many workers at Parbati project site were severely affected and even after this incident; the corporate didn't put in place any disaster mitigation mechanism. It didn't even review the risks involved with carrying out tunneling work in night shifts during the month of monsoon in this region. As a result of such a negligent attitude, during 2004 monsoon, when a flash flood hit the project site, where workers were inside a tunnel working on a night shift, all of them got trapped. Only after 20 hours could workers breathe fresh air when they were rescued out of tunnel.

On June 28, 2005, following a landslide on the mountain top, floodwaters loaded with heavy boulders hit the iron gate installed at the entrance of 590 m long tail race tunnel at Ghatghar Pumped Storage HEP under construction near Dolkhamb village of Thane district in Maharashtra. The 250 MW HEP was nearing completion and was slated to be commissioned by the year end. 62 labourers and technicians, including a few Japanese nationals, managed to escape using an emergency exit, but about 22 workers were feared trapped, as per reports that trickled in initially. The rescue operation couldn't take off on the night of 28 June, since the tunnel was about 14 km away from the road, and it was flooded with 12-18 feet deep water, gushing out with intense force. The rescue operation could start only at 8 am on 29 June, and naval divers could trace two dead bodies before the light faded. 48 hours after the incident, on the evening of 30 June, four more bodies were recovered. The survival chances of the remaining trapped workers were extremely bleak. Executive Engineer of the project, S P Kulkarni had told a news agency, "The region witnessed unprecedented rainfall in the last few days. As

a result of rainfall, there was a landslide on the mountain that houses the power project in its belly".

Kanchi Kohli from Kalpavriksh, fresh from a visit to the Parbati II HEP site in August 2007, said, "the Tunnel Boring Machine at the Sheelagarh side where the Adit is

In NHPC's Parbati II project in Himachal Pradesh, a Tunnel Boring Machine has been stuck inside an under construction tunnel since last year, buried under a sudden burst of sand and water. That project has seen many geological and flood disasters, leading to numerous deaths and large scale destruction.

being constructed by SSJV has gotten stuck due to sudden burst of water and sand last year. Villagers say that the water was reddish in colour, pointing out to the colour of rocks on the mountains. This has been a very big set back to the project, the TBM has still not been recovered from the tunnel. This clearly came out

in discussions with villagers in Manihar valley, Garsa village and also labourers. The information was backed up by a reporter in Divya Himachal." The work in this site is being carried out by SSJV constructions. SSJV was formed in the year 1994 and is promoted by Sri Shankaranarayana Construction Company, Bangalore and Maytas Infra Pvt Ltd, Hyderabad.

On July 5, 2005; 550 m long diversion tunnel of the under construction Baglihar HEP in Jammu and Kashmir collapsed and a portion of the surrounding hills caved in to dam. About 250 workers had a close shave when they got trapped at a workshop at the dam site.

Just one day before on July 4, 2005, a reporter working with Business Standard filed a news story on the trouble in the underground shaft tunnel of NHPC's 280 MW Dhauliganga hydropower project, situated near Pithoragarh in Uttaranchal. Built at Rs 1500 crores, the project was scheduled for commissioning on March 31, 2005; but due to some unexplained technical reasons NHPC has postponed its commissioning several times. The trouble began when NHPC authorities released water inside 5.5 km long underground shaft tunnel to test the turbines during June. Within minutes of the trial run, Ailagarh village, situated at the higher reaches of the project got flooded, creating panic in the area due to the excessive releases of water through shaft holes. The District Magistrate confirmed the incident and said 24 families were shifted to nearby areas.

Though, as usual, being unmoved by human miseries, the NHPC claimed to have rectified the faults and desired to commission the project by August 2005, the state govt officials remained skeptical. Speaking to Business Standard, a top govt official stated, "We can not take chance with the life of villagers. We have instructed the NHPC to make sure that no such leaks occur in the near future". But, will mere instruction make NHPC embrace social responsibility?

There have been similar incidents of negligence in NHPC projects in the past also. In the very first year of commissioning of Loktak HEP, in Manipur, a portion of tunnel collapsed following heavy rainfall on July 25, 1983.

An enquiry committee set up to investigate the tunnel collapse had observed; “a) Geologists had specifically brought out the necessity for taking surface protection measures in the slopes where tunnel was on low cover. Possibility of the over crown being washed away from overburden movements over the years was foreseen. This aspect did not appear to have been taken note of by the project designers till the accident. b) The Commissioning of the project in April 1983 was preceded by a Technical Advisory Committee’s meeting to finalise the filling schedule and other connected matters. There was however, no discussion among designers, geologists and the project team on the aspect of design and construction of tunnel lining in the low cover zone and no rock reaches.”

In May 1991, ten transmission towers of NHPC’s Chamera 1 HEP collapsed in Chamba district Himachal Pradesh. On Dec 12, 1993 the entire length of the second span of the bridge across river Siul at Chamera HEP erection collapsed into the river below, resulting in the death of 16 labourers. Two labourers were buried alive

and two others were seriously wounded in a landslide at Chaura village on the bank of Chamera reservoir on August 1 2003. In NHPC’s Chamera II project, 500 m stretch of the coffer dam at Bagga village in Chamba district in Himachal Pradesh was washed away by sudden rise in water level of Ravi River after heavy rains in catchment area, leading to substantial financial losses.

The hydropower industry in India seems to have become habitual in its complacency and remains unwilling to learn any lessons from the past blunders. So is there a hope to imagine a disaster free dam operations in India? Have our structural engineers internalized a lesson or two on the need of “defensive engineering” during the pre-feasibility, planning and design stage for dam projects? Explaining the term, US Dam safety expert Robert Jansen says, “dams require defensive

engineering, which means listing every imaginable force that might be imposed, examination of every possible set of circumstances, and incorporation of protective elements to cope with each and every condition.”

In a real world, the financial viability concerns and economy has a bearing over the degree of “defensive

The World Bank funded Nathpa Jhakri HEP in Himachal Pradesh also ignored the geological and hydrological realities of the Sutlej basin, leading to two events that left deaths and destruction in their wake.

engineering” that is applied to the design of a dam. International Commission on Large Dams – a pro Large Dams organization – itself recognizes the conflict, stating in its 1987 guidelines on dam safety that: “For

every dam project, a balance has to be found between dam safety and economy.”

A confidential 1991 the World Bank report notes that because of “financial factors and local pressure to take shortcuts or ignore poor quality work,” construction quality in India is “deficient for a number of dams, posing serious potential risk to downstream populations.”

Dams in India chronically suffer from tendency to “cut corners” to make them appear cost effective and it is high time some thought is given to geological risks and hazards they pose. It is also necessary to put under the lenses the role of the central regulatory agencies like the Central Water Commission and the Central Electricity Authority that have refused to take any action against the dangerous negligence of the developers. It seems this is nobody’s baby, unlike in US, where the Federal Electricity Regularly Commission also regulates the safety of operations of the dams.

It is nice hearing the World Bank saying that, but the World Bank funded Nathpa Jhakri HEP in Himachal Pradesh also ignored the geological and hydrological realities of the Sutlej basin, leading to two events that left deaths and destruction in their wake. The first event occurred in the monsoon of July-Aug 1993 when the floods in Sutlej river damaged the under construction work. The floods on Aug 11, 1997 and Aug 1, 2000, similarly

created huge damages at the project site. The damage in the year 2000 ran into several hundred crores as direct loss to the HEP. The other major loss was the delay in completion of the project that by about one year.

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Himanshu Upadhyaya (The author works with Intercultural Resources, New Delhi) (with inputs from SANDRP)

WATER POLICY

Attempt to push NEWRA A High Level delegation from the Central Water Commission and Brahmaputra Board recently called on the Arunachal Pradesh Chief Minister Dorjee Khandu to see his approval for the proposed North East Water Resources Authority, as Arunachal Pradesh has so far opposed its constitution. At the meeting, Arunachal Pradesh govt sought a clear cut concept note, framework with detailed guideline as to who the state will benefit from it. The state water resources minister said that the Brahmaputra Board was functioning contrary to its objectives of serving the entire North East, as it did not take up a single project in Arunachal so far. Earlier Union Water Resources Minister also said that the proposal was under active consideration of the govt. (Assam Tribune 050707, Indian Express 130707)

Assam Water Policy The Assam Science, Technology and Environment Council is preparing the Draft Assam Water Policy for the state government and will be submitted soon. This is also one of the requirements for the loan from the Asian Development Bank. (Assam Tribune 120707)

AGRICULTURE

Peanuts for Organic Farming According to information given by the Union minister of state of Agriculture in Lok Sabha on May 15, 2006, total area covered under organic farming in the country is about 12.84 lakh ha and total funds allotted for the promotion of agriculture during the Tenth Five Year Plan were Rs 57.05 crores (Parliament Digest, Budget Session 2006, NCAS). This is less than peanuts considering the kind of support fertiliser and other chemicals get. There is urgent need to reverse this priority.

Fertiliser subsidy Rs 2632 per ha: What about organic farmers? The Fertiliser subsidy in the current year is likely to become Rs 50 000 crores (Financial Express 010807). Considering India's gross cropped area of 190 million ha, this comes to around Rs 2632 per ha. However, this subsidy is unevenly distributed and lion's share goes for irrigated areas, which get double subsidy from the govt, first the subsidy in terms of creation of irrigation at public expenses and then fertiliser subsidy (among others). The tribal areas (who generally do not use fertilisers or use it at very low rates) and organic farmers are clearly left out of the benefit of the subsidy. To evenly distribute the benefits, the government should consider giving equivalent subsidy to these sections. Moreover, by not using the fertiliser, these sections are also reducing the global warming potential as use of fertilisers increases the global warming. Thirdly, the govt should also consider giving subsidy for those using organic fertilisers, as why should the chemical fertilisers use should be encouraged, when it is known that organic fertilisers can in fact give better results?

Food Subsidy or FCI subsidy?

According to Union Minister of state for Agriculture in Lok Sabha on Feb 20, 2006, following the expenditure incurred on food subsidy and on FCI (Parliament Digest, Budget Session 2006, NCAS):

	2002-03	2003-04	2004-05 (Provisional)
Expenditure			
Storage	1286.57	1190.58	1499.00
Interest	3444.94	2427.97	2631.00
Total	4731.51 (68.44%)	3618.55 (38.19%)	4130.00 (30.66)
Subsidy			
BPL	5994.08	8069.58	10469.00
APL	919.63	1406.26	3001.00
Total	6913.71	9475.84	13470.00

It is interesting to note that upto 68% of the expenditure on subsidy goes to the storage and interest cost of the Food Corporation of India.

Diversion of PDS foodgrains In answer to another question on Rajya Sabha, the minister said that 53.3% of the Wheat and 39% of the rice meant to be distributed under the Targeted Public Distribution System during 2003-04. The minister, quoting an ORG Marg study said that in a number of states (e.g. Assam, Sikkim, Manipur, Meghalaya, Mizoram, Nagaland) all the wheat allocated is diverted!

POWER SECTOR

NTPC, ADB MOU for renewables NTPC Ltd has signed a memorandum of understanding with the Asian Development Bank to set up a joint venture company for renewable power generation. NTPC and other govt entities will hold upto 50% in the JV and other strategic investors will hold the remainder. ADB is expected to acquire 20 percent at a later stage. Financial details were not disclosed. Over the next three years, the JV will hold a portfolio of about 500 MW of renewable generation. Initially, it will focus primarily on wind power and mini and micro hydroelectric power projects. It may also include other renewable power generation resources such as solar, geothermal and bio fuel projects. (Reuters 240707)

Revenue loss of Rs 9400 Cr in MP The Comptroller and Auditor General of India has indicted the Madhya Pradesh State Electricity Board for transmission and distribution loss far exceeding the acceptable level. "T and D loss of the Board ranged between 45.57 and 42.62 % during five years ended March, '05 as against the acceptable level of 15.5 %, resulting in loss of potential revenue to the tune of Rs 9,397.47 crore," said the CAG Report (Commercial) for the year ending March 31, '06. (Central Chronicle 310307)

POWER OPTIONS

Peak Management by Freezing water A number of urban companies in New York and elsewhere re adopting novel way of managing the peak electricity demands. These companies freeze water during off peak hours and use the melting ice to cool the buildings during peak hours. Thus, Credit Suisse lowers peak by 900 KW and Morgan Stanley by 740 KW, this also leads to reduction their total consumption of electricity. (The Hindu 250707)

WATER SUPPLY BUSINESS

Norconsult under cloud for corruption in WB funded Tanzania Project Norconsult International, a leading Norwegian consultant agency, has come under cloud for making cash payments of USD 146500 without proper documentation in Tanzania for a USD 6.7 million consultancy in the World Bank funded Dar Es Salaam Water Supply and Sanitation Project in Tanzania and face being black listed by the Bank. The contract was signed in July '03. Norconsult tried to apply for voluntary disclosure programme under the WB to escape the debarment, but withdrew when it became public that application under VDP was made after investigations were started by the World Bank. Norconsult has signed about 20 contracts with the Bank since Oct 2000, amounting to USD 25 million. (Development Today 290507)

GROUND WATER

Tamil Nadu: 46% wells show decline The groundwater level in 46% of the wells under observation all over TN has declined over the last one decade. According to the Central Ground Water Board, a comparison of water level data of May 2007 and the mean water levels of last one decade showed that in the rest of 54% of wells, the water level has gone up between 0 and 6 meters. The fall has been spotted in the wells of Kancheepuram, Dharmapuri, Tiruvannamalai, Thanjavur, Ramanthapuram and Vellore districts. (The Hindu 300707)

GROUND WATER CONTAMINATION

Janhit Report on Malsinghwal Janhit Foundation has just published a new report titled *A case study of Malsinghwal: The Village for Sale in Punjab*. The report, authored by Tamosi Bhattacharya is based on Janhit Survey of the Malsinghwal village in Budhiada block in Mansa district in Punjab in January 2007. The report goes into the issue as to why the villagers decided to put up the village for sale in July 2005 after a drought like situation and repeated crop failures. It also shows how serious are the consequences of contamination of the groundwater, particularly when groundwater is the main source of irrigation and even drinking water, when the govt supplies are not reliable. The contamination of groundwater due to excess fluoride (natural reasons) and pesticides (anthropogenic reasons) have lead to some serious health problems. One would have

expected the authors to look at the options like rainwater harvesting and also expected them to talk with the govt (e.g. district administration) before the report is made public, for it would have only added value to it. Janhit Foundation has promised to disseminate the report widely and if necessary go to the Court, for, "large parts of Punjab as well thousands of villages in India are" in the same boat, according to the report. Indeed the groundwater contamination is a hidden crisis, the seriousness of whose consequences nobody seems to have realised.

RIVERS

Water Requirement for Chambal River While hearing Interlocutory Application No 1698 for seeking permission to draw water from Chambal River to meet the needs of drinking water of districts Karauli and Swaimadhapur by State of Rajasthan through Secretary, Public Health and Engineering Department (Rajasthan, the Central Empowered Committee Appointed by the Supreme Court raised very important issues. The CEC observed that 4-5 schemes for the purpose of drinking water have already been approved and recommended by the Supreme Court. Therefore before recommending the present additional scheme, the CEC wanted to know what the details of water availability in the river are. What is the water requirement from all the projects already approved? What is the minimum committed water flow required for the conservation of the Ghariyal? The application before the CEC only gives details of the current minimum flow. The CEC clarified that the above information is required before new projects can be commissioned. The CEC also observed that it would be good if a study can be done through the Ministry of Environment and Forests so that they are also aware of and clear on how many more projects can be granted clearance. It was also observed that the study cannot be completed in a couple of weeks and adequate time needs to be given for it. It was decided that the hearing will be fixed once the applicant files the necessary information. (Forest Case Update May 2007)

ENVIRONMENT

New mining policy in AP The Govt of Andhra Pradesh has reviewed state sand mining policy to make it more eco-friendly. The state govt has imposed the ban on use of machinery and restricting the depth for extracting sand from riverbeds and other water bodies to two meters as this may lead to over-exploitation of the sand from mines. This in turn is likely to affect the groundwater table. The restriction on the depth up to which the riverbed could be excavated has been resorted to ensure proper flow in the river and thus save ecology. As part of the policy, use of rock sand will be encouraged in order to reduce pressure on riverbeds. Apart from these, the new policy also includes rules for auction and rate of river sand in the state. (THE HINDU, BUSINESS LINE 151106)

THE PAKISTAN PAGE

Mangla dam raising Project The govt of Pakistan has decided to pay the remaining Rs 14 billion to the affected families of the Mangla Dam raising project. It has also been resolved that the dam would not be filled with water upto the extra height until the completion of resettlement of dam oustees, to be completed by June 2008.

Salient Features (existing project)	
Dam type	Earth fill
Height	380 ft. (above riverbed)
Length	10,300 feet
Lake Area	97.7 sq. miles
Catchment Area	12,870 Sq miles
Gross Storage Capacity	5.88 MAF
Live Storage Capacity	5.34 MAF
Main Spillway Capacity	1.01 million cusecs
Year of Completion	1967
Hydropower Generation	1,000 MW from 10 units of 100 MW each
No. of people to be displaced by raising of dam	40,000

(DAWN 290507, www.waterinfo.net.pk 310507)

41% cost increase for Neelum-Jhelum HEP Wapda estimates that the cost of 969 MW Neelum-Jhelum HEP will increase by more than 41% to \$2.1 billion. The estimates are based on the \$1.5 billion lowest bid offered by a Chinese consortium, according to the actual project cost phasing over a period of eight years. The cash requirement plan suggests that Rs 90.9 billion (\$1.5 billion) cost offered by the consortium would in effect reach Rs 128.4 billion (\$2.14 billion) in eight years. This also includes interest payments of more than Rs 29 billion. The plan also suggests that the final cost of the project would be more than 105% higher than Wapda's estimate of Rs 62.25 billion (\$1.04 billion). The govt has already released Rs 5 billion as mobilisation advance to the executing agency to start the work. Pakistan will need to spend \$85 million for the start-up operations in the first year of the project's implementation. On completion, the project will generate electricity at a cost of Rs 1.91 per unit, which is much higher than the engineers' estimate of Rs 1.42 per unit.

Salient features	
Project Duration:	July 2002 – June 2010
Gross Head	420 m (original plan of 213 m)
Dam Height	148 feet
Water Diverted	280 cubic m/sec
Length - Headrace Tunnel	32.5 km (original plan 28.49 km)
Power Installed Capacity	969 MW (original plan 500 MW)
Annual Energy Production	5,150 GWh

WAPDA has awarded a contract for the construction of the Neelum-Jhelum HEP at a cost of \$US1.5 billion to a consortium of the China Gezhouba Group Company and the China Machinery Export Corporation. (Dawn 280507, http://www.waterinfo.net.pk 010607, Asia Pulse 130707)

ADB's US\$65.9 million loan for 5 HEPs The Punjab govt under the Renewable Energy Sector Development Programme has taken up the preliminary tasks of establishing the Punjab Power Development Company and construction of 5 HEPs in Punjab. Negotiations with financiers for Rs 4 billion (US\$ 65.9 million) financial assistance have been completed. The Punjab govt will contribute 20% while the remainder of the amount would be provided by the Asian Development Bank. (PPI080507)

Balochistan warns over Mirani R&R Balochistan govt has warned Wapda about the political and social problems if resettlement plan relating to the Rs 5.8 billion Mirani dam project is not implemented in a transparent manner. The warning followed the submission of a revised settlement plan by Wapda to the federal govt demanding Rs 741 million more for the purpose. The total area which will be submerged under the reservoir at 244 ft is about 17 982 acres. The RAP also includes resettlement and compensation for houses between the Canal Command Area and the lower riparian area of the river's reach 235 miles downstream up to Jiwani. Report stated that the affected people of 7,669 acres have been paid compensation, the affected of the remaining area are yet to be compensated. (DAWN 040507)

Mirani Dam is the Cause of Floods The floods in Turbat, the headquarters of Kech district in the coastal region of Balochistan, have intensified a controversy over a dam located 43 km west of the town. After the June 26 heavy rainfall, the reservoir rose to 271 feet asl. The backflow created waves large enough to hit areas up to an elevation of 271.44 feet asl, devastating more than 40 villages over 36,000 acres of land and rendering nearly 70,000 people homeless. A district health official, Dr Mohammad Saleem, says, "Without the dam, we would not have had devastation at this scale". People in Turbat generally believe that while floods in the valley are not a new phenomenon, last week's devastation was largely caused by the back-flow of water from the reservoir of the dam. (BBC 050707)

Loan sought for Diamer-Bhasha, Kalabagh & Akhori Pakistan has sought \$17 billion from international lenders including the World Bank, ADB and IDB for the construction of Diamer-Bhasha, Kalabagh and Akhori dams by 2016 to avert flood, drought and energy crisis. Wapda chairman has urged development partners to give priority to Pakistan's irrigation and storage infrastructure. The govt has allocated Rs 48 billion for the water sector and planned Rs 60 billion allocation in next year. Senior water advisor to the World Bank in Pakistan, David Grey, stressed on need for focusing on benefit sharing, rather than water sharing and said that there was a need to develop inter-provincial and community level mechanism. He asked the Pakistan govt to explore hydel potential and go for Ghazi Barotha-like projects between the proposed Diamer-Bhasha dam and Terbel dam which could produce about 8000-9000 MW of electricity. (DAWN 280407)

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

1. *Large Dams for Hydropower in NorthEast India* SANDRP-Kalpavriksh, June '05, p 228, Rs 150 (indv), Rs 300 (inst)
2. *Tragedy of Commons: The Kerala Experience in River Linking*, River Research Centre-SANDRP, '04, p 146, Rs 120
3. *Unravelling Bhakra*, Shripad Dharmadhikary, Manthan, 2005, pp 372, Rs 150/- (individuals); Rs 300 (institutions)
4. *THE GREATER COMMON GOOD* by Arundhati Roy, Published by India Book Distributors, 1999, pp 76, Rs 80/-
5. *Citizens' Guide to the World Commission on Dams*, By A Imhof, S Wong & P Bosshard, IRN, pp 59, Rs 30/-.
6. *Know Your Power: A Citizen's Primer on the Electricity Sector*, Prayas, Pune, 2004, p 138, Rs 150/-
7. *Green Tapism: A Review of the EIA Notification-'06*, Environment Support Group, Bangalore, 2007, p 201, Rs 250/-
8. *Dam Vs Drinking Water: Exploring the Narmada Judgement*, LC Jain, Parisar (Pune), 2001, p 134, Rs 75/-
9. *Insidious Financial Intrusions in India's North East*, IR & FIPA, April '06, pp 100, Rs 50/-
10. *Tehri Environment and Rehabilitation: Towards Failure and Devastation*, Published by MATU, pp44, Rs 25/-
11. *Conserving Raindrops a Much Better Option than Linking Rivers* by Bharat Dogra, pp 8, Rs 4/-.
12. *The Forest of the Buddha*, By Bulu Imam & Philip Carter, Sanskrit Publishers, Jharkhand, 2005, pp 121, Rs 650/-

PUBLICATIONS IN HINDI:

1. *Bandh, Nadi evam Adhikar* Dam Action Guide for Communities, SANDRP, 2007, pp 44, Rs 30/-
2. *Nadi Jod Yozana Ke Mayne, Vastvikta Ke Aaine Mein* (HINDI), SANDRP, 2004, pp 58, Rs 20/-.
3. *Ken-Betwa Nadi Jod : Pyasi Ken Ka Paani Betwa Mein Kyon?* (HINDI), SANDRP, 2004, pp 46, Rs 20/-.
4. *Nadi Nahin Jodnaa, Bund Bund sanjonaa* by Bharat Dogra, pp. 16, Rs 8/-
5. *Bade Bandh, Bharat ka Anubhav*: Hindi, SANDRP, 2001, pp 268, Rs. 100/-.
6. *Vishwa Bandh Ayog per Nagarik Margadarshika* (HINDI), SANDRP, 2002, pp 63, Rs 30/-.
7. *Bharat mein Bade Bandh ka Lekha jokha* (Hindi) summary of WCD India Country Study, Manthan, pp18, Rs 5/-.
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9. *Bina Jaankari Kaisy Jan Sunvai?*, MATU (Delhi), 2004, p 32, Rs 15/-
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NEW PUBLICATION FROM SANDRP & IRN**Dams, Rivers & Rights****Action Guide for communities affected by dams – in Hindi and English**

SANDRP has just published in Hindi, "*Dams, Rivers & Rights*" an action guide for communities experiencing adverse impacts of dams. The action guide was earlier published by the International Rivers Network in English, "to empower communities threatened by new dams and to share ideas from the growing international dam movement. It is hoped the guide provides information and tools to help communities to decide how to respond to a proposed or existing dam, how to protect rights and demand a voice in the decisions. Over the years, movements have also been proposing better or rather real options for fulfilling justified water and energy needs of the society.

The Hindi edition is not a literal translation of the English edition. We have tried to change the examples, text and figures, to contextualize the guide for Indian/ South Asian audience. Some additional text and material has also been added, where appropriate.

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