

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."

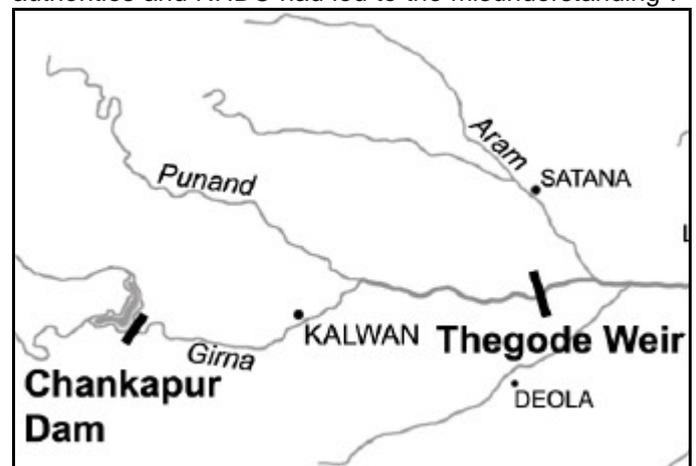
NESPON's fact-finding team also came across 14 new landslides between these two dam sites and increasing erosion on Left bank near Mongpong. The Irrigation

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 Girma 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 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,

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.

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

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."

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.

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."

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.

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.

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