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Dams, Rivers & People

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Lead Piece

THERE IS NO CASE FOR INCREASE IN HEIGHT OF SARDAR SAROVAR DAM

Signal from the System: Laws do not matter The events of last five weeks around Sardar Sarovar Project have given a clear message to the poor and struggling people of Narmada Valley and everyone else that rule of law does not matter, people can go to hell, the dam construction will not stop. Look at the facts: The Narmada Tribunal Award and the Supreme Court orders (in Oct 2000 and again in March 2005) have stipulated that at each stage, the dam height can be raised only when all the families to be affected by such construction have been given at least two hectares of cultivable and irrigated land a year in advance of submergence and full rehabilitation as per the norms have been completed at least six months before submergence. There is no provision in the norms for cash compensation. Madhya Pradesh Chief Minister said in January 2006 that if the height of dam is increased from the current 110.64 m to 121.92 m as proposed this year, than additional over 24 500 families would be displaced. The MP govt. has refused to provide land to the displaced as legally required. When Narmada Bachao Andolan said that the permission given on March 8, 2006 by the Narmada Control Authority to increase the height of the dam to 121.92 m is illegal and inhuman, the concerned authorities were least bothered. Ultimately, after launching of indefinite protests on March 17, 2006 and indefinite fast by three NBA activists on March 29, 2006 and after a lot of efforts at each stage, a group of Union ministers visited the affected area, submitted a report, called a Review Committee meeting, passed the buck to the Prime Minister and the Supreme Court. All the state governments have shown rehabilitation on paper when ground reality showed how wrong their claims were. The Prime Minister, showing the most weak, irresponsible and inhuman face of the Union government, bent down before the fascist acts of BJP. The promise of the Union govt to the Supreme Court that rehabilitation will be done in three months is violation of every legal norm. Moreover, when the Madhya Pradesh have not been able to give land for two decades, from where will they produce land for the thousands of affected in three months? The Supreme Court, refusing to see the evidence of total break down of Rehabilitation machinery including the Grievance Redressal Authorities appointed by itself and refusing ensure implementation its own orders, decided not to stop construction on the Dam on April 17 and again on May 1, 2006. This when there is no justification for increase in height of the dam as Gujarat has been unable to utilise even 10% of the water available at current height. The message could not have been clearer.

There is no justification for increase in height of the dam as Gujarat has been unable to utilise even 10% of the water available at current height

Benefits: Claims vs Reality Gujarat has claimed in its affidavit in the Supreme Court in April 2006 that increase in height of the Sardar Sarovar dam from 110.64 m to 121.92 m would lead to three kinds of benefits: Drinking water, Irrigation & Power. These claims need to be closely examined. While examining these claims, the claims made by Gujarat govt when the case for increasing the height from 100 m to 110.64 m was made needs to be kept in mind.

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Thus, when dam height was increased from 100 m to 110.64 m, Gujarat claimed that this will lead to:

- Availability of additional 3.5 Million Acre Feet (MAF) water for Gujarat and Rajasthan
- Additional irrigation to 2.18 to 5 lakh hectares.
- Increase in storage capacity from 2600 Million Cubic meters (MCM) to 3700 MCM.
- Sufficient water for taking drinking water to whole of Gujarat.

Let us look at the correct position about benefits available at 110.64 m.

Drinking Water According to the Sardar Sarovar Narmada Nigam's website (www.sardarsarovardam.org), *"A special allocation of 0.86 MAF of water has been made to provide drinking water to 135 urban centers and 8215 villages (45% of total 18144 villages of Gujarat) within and out-side command in Gujarat for present population of 18 million and prospective population of over 40 million by the year 2021."*

Thus, water required for providing drinking water to the full 8215 villages and 135 towns was available at 110.64 m in June 2004 itself, when total water available at SSP was 3.5 MAF as claimed by Gujarat govt. The Gujarat govt's contention now that if the dam height is increased to 121.92 m, it will be able to provide drinking water to 4000 villages 57 cities/urban centers instead of 2044 villages and 57 cities/urban centers which is being provided currently is an attempt to mislead the Supreme Court and the people Gujarat. If Gujarat had put in place the delivery system necessary to take drinking water to all the 8215 villages and 135 towns as per plans by June 2004, it could have provided drinking water to all the planned areas by June 2004. If it has not been able to do it, that is only because of its own lack of capacity to put in place the required delivery system and not due to lack of availability of water at SSP.

Water required for providing drinking water to the full 8215 villages and 135 towns was available in Aug '02 or earlier. The water could not reach the people because Gujarat could not put in place the delivery system

In fact, even from 20 August 2002 when Gujarat inaugurated the Irrigation By Pass Tunnel (IBPT, constructed at an elevation of 89.3 m to take water to the canals from the reservoir, bypassing the Canal Head Power House (CHPH) as CHPH can function only when water in reservoir reaches 110.64 m or above), sufficient water was available at SSP for providing drinking water to all the planned areas as the capacity of the IBPT at reservoir level of 98 m (achieved in 2001) is 283.12 cubic m per sec (10 000 cusecs) (see page 61 of Annual Report of Ministry of Water Resources for 2004-5), far greater than the requirement for drinking water supply. At 110.64 m, IBPT capacity goes up to 441.66 cubic m per sec (15 000 cusecs). Thus if Gujarat is not able to provide drinking water to the planned areas till date, it is only the inability of the state government to put in place the required delivery system that is responsible and there is no need to increase the height of the dam for this purpose.

Furthermore, the section 3.2 of the CAG Report for the year ended 31 March 2005 for Gujarat (Civil) states:

*"**Highlights**: Sardar Sarovar Narmada Canal Based Bulk Water Transmission Project aimed at providing assured safe drinking water to scarcity-hit Saurashtra and Kachchh regions. The master plan envisaged distribution of water through regional and group water supply schemes. The Project commenced in 1999-2000 was scheduled to be completed by 2002, but, was lagging behind due to defective planning and lack of co-ordination among different agencies. Water was being supplied only to 31 per cent of the projected villages and large number of villages and towns had to rely on local sources/water tankers. Some of the significant points noticed in audit are as follows:*

⇒ *Only 29 % of installed capacity of water was used and only 415 of 1,342 targeted villages/ towns were covered (31 %). (Para 3.2.8.3)"*

It is clear that Gujarat planned to provide drinking water to all the villages by 2002. However, it has not been able to achieve this till date because Gujarat has been unable to put the required delivery system in place and not because of lack of availability of water from SSP.

Irrigation When clearance was given to increase the height of the SSP dam to 110.64 in March '04, Gujarat govt claimed that this will make available to Gujarat an additional 3.5 MAF of water and help achieve additional irrigation of up to 5 lakh ha. If we consider the fact that Gujarat plans to provide irrigation to 17.92 lakh ha of land from its share of 9 MAF from Narmada (even after subtracting the M&I share and adding the planned GW addition), that from 3.5 MAF, it can irrigate over 6 lakh ha. However, for this irrigation benefits to be realized, the full infrastructure of taking the water to the farm needs to be put in place. However, according to official website of Sardar Sarovar Narmada Nigam Limited, Gujarat has been able to irrigate this year about 57,539 ha of land, less than 10% of what it claimed could be possible when the dam height was increased to 110.64 m. Thus, the claim of Gujarat now that if the dam height is increased to 121.92, it would be able to additionally irrigate 3.5 lakh ha is misleading and a futile attempt to cover up its failure to utilize even 10% of the water available at 110.64 m as per the SSP plans. Use of SSP water for release into rivers like Sabarmati, or into other lakes etc that Gujarat has been doing since August 2002 (when IBPT was inaugurated) does not find any place in SSP plans and is again a sign of failure on the part of Gujarat to utilize the water available at 110.64 m.

It is noteworthy to compare SSP's performance with other more local irrigation initiatives in Gujarat. As per page 15 the "Socio Economic Review Gujarat State, 2004-05" published by the Government of Gujarat, an additional irrigation of 3.5 lakh ha [this figure was 2.15 lakh ha as mentioned on page 15 of "Socio Economic Review, Gujarat State, 2003-04, similarly in the Gujarat Budget speech for 2003-4, Gujarat Finance Minister said in March 2003 that "Approximately 2 lakh ha of irrigation potential has been created from check dam/ tank constructed in rainfed non irrigated area under Sardar Patel Sahbhagi Jalsanchaya Yojana".] has been achieved in Gujarat, through *"indirect benefits through water conservation programme"*. This benefit has mostly come about in Saurashtra, largely over the last five years and in this effort the local communities have played a very big role. It is also relevant to note here that the total expense on this effort has been less than 10% of the money spent on SSP so far (over Rs 21, 000 crores). It may be recalled that total area to be irrigated by SSP in Saurashtra is almost the same figure at 3.86 lakh ha. This only illustrates that alternatives to SSP for Gujarat exist and they provide faster benefits, that are much cheaper, and they come without the huge social and environmental impacts that SSP has. Moreover they are much more participatory.

Gujarat could have irrigated over 5 lakh ha from water available at 110.64 m. What it has been able to achieve is only 57 000 ha. Where is the case of increasing the height of the dam?

Gujarat has created irrigated potential of only 25 000 ha from SSP (including through conjunctive use, which basically means pumping of groundwater, not only through canal irrigation) by June 2004, as per the Socio Economic Review of Gujarat for 2004-05. In fact, page 15 of Gujarat Review for 2003-04 also gives the identical figure of 25 000 ha achieved by June 2003, which means that no additional irrigation was achieved from June 2003 to June 2004 and only 32 000 ha has been added (to make the total to 57 539 ha by March 2006) between June 2004 to March 2006.

Page 18 of Socio Economic Survey for Gujarat for 2003-04 says about irrigation planned from SSP:

"(vi) Irrigation : *It is planned to irrigate about 47800 ha area during the current year 2003-04. Irrigation about 29306 ha area directly and 73756 ha indirectly is done up to March, 2003."*

However, as we have saw above, Gujarat did not achieve these targets in June 04 or even in March 06.

Further, it is also useful to note here what Gujarat's Finance Minister said while presenting the budget for 2005-6 on Feb 18, '05:

"Narmada Yojana *The volume of works carried out for Sardar Sarovar Yojana during the year 2004-2005 has been the highest compared to the works carried out in all the previous years. Formerly, the height of the dam was increased maximum 5 meters at a stretch in a year, but for the first time it was increased up to 10.64 meters in a year and reached the remarkable height of 110.64 mts.*

Irrigation facilities will be made available in 3 lakh hectare area by taking up the works of irrigation area development during the year."

However, it is clear from SSNNL website that Gujarat has been unable to achieve this target as of April 2006.

Power Many contradictory claims are being made about power generation possible if the height of the Sardar Sarovar Dam is increased from the current height of 110.64 m to 121.92 m. Simple physics tells us that actual power generation would depend on three factors: quantum of water available for power generation, height through which the water falls and availability of power generation units (machinery). If all other factors remain constant, then power generation would be directly proportional to the height through which water falls. Thus, the loss of power if height of the dam takes a pause at 110.64 m instead of raising it to 121.92 m would be about 10.9% for power generation from River Bed Power House (RBPH) and 35% for power generation from Canal Head Power House (CHPH). These loss figures also take into account the fact that at 121.92 m there is some additional storage available. Taking into consideration the fact that in 2005-06, of the total power generation at SSP, CHPH generated 9.3% and RBPH generated 90.7%, the loss in power generation at SSP if the dam height is halted at 110.64 m, would be 13.14 %. Thus, if the claim is that SSP can generate 400 crore units at 121.92 m, then the annual loss in generation, if the dam height takes a pause at 110.64 m, would be 52.5 crore units. In reality the loss would be much lower if the dam construction is halted now as the dam has already been raised beyond 110.64 m. Thus the claim made by Gujarat government that increase in dam to 121.92 mts would lead to additional 350 crore units of electricity generation at SSP is totally baseless. In fact the increase due to additional height will only be 52.5 crore units, equivalent to Rs 105 crores.

There is an easy way to verify that the claimed 350 crore units of additional power generation is an exaggeration. Since SSP generated about 196.2 crore units in '05-06 (even though all the power generation units were not in place), if this claim were true, SSP would generate 545 crore units a year at 121.92 m. This claim is proved false by the Narmada Control Authority Document "Need for Hydro-electric Power Development at SSP" of July 1990.

According to this official document, even at full height, SSP can generate about 546.9 crore units. Thus when 121.92 m is full 17 m below the full height, SSP cannot generate 545 crore units as claimed. It is clear Gujarat is

once again making baseless and misleading statements to falsely push its case for increasing the dam height.

However, let us see the SSP track record. The dam height of 110.64 m was reached in June 2004. Thus, if all the power generation units were to be in place by that date (it should have been as installation and dry test run of power generation units do not depend on increase in dam height), all the units could have started generation from July 2004. Unfortunately, all the power generation units were not in place in June 2004, nor are they in place even today, entirely due to the mismanagement of the project authorities, leading to massive loss of power generation at SSP even after the dam height of 110.64 m was achieved. Even taking into account the seasonal variation in water flow at SSP, in the 21 month period between July 2004 and March 2006, SSP could have produced about 667 crore units when the dam was at 110.6 m. In reality, it produced 221.5 crore units. Thus, SSP produced about 445.5 crore units less than what it should have produced in this 21 month period. This massive under performance and loss is entirely due to the inefficiency and mismanagement of the Sardar Sarovar Nigam and responsibility needs to be fixed for this loss. This loss is more than what SSP would loose even if height is halted at 110.64 m for over 8 years. It does not seem that power generation is a big priority at Sardar Sarovar Project. It is also relevant to note here that T&D losses in the three beneficiary states (Gujarat: 32.36%, Maharashtra: 36.62%, Madhya Pradesh: 37.71%) are much above the accepted norms of 15-20% and that little efforts are being done to reduce the losses. There is little justification for increasing the height of the SSP dam to 121.92 m even from power generation point of view, till acceptable, legal and just R&R is achieved.

In 21 months from July 2004 to March 2006, SSP produced 445.5 crore units less that what it could have produced if all the power units were in place by June 2004. They are not in place even today… it seems power generation is not the priority at SSP

Another false and misleading claim which has been made by Gujarat govt is regarding the Water Diversion from SSP. The Gujarat govt has claimed that water for any purpose cannot be drawn below 110.64 m is again false and misleading. Gujarat in fact has been using water from SSP since at least 5-6 years. Before August 2002, it was pumping water from the existing reservoir into the canal. Between August 2002 and August 2004, it was diverting water through the IBPT and since August 2004 is has been diverting water through the CHPH. This water has been used for all the designated purposes of drinking water supply, irrigation and for power generation. It needs to be kept in view that Narmada is a perennial river, so some water is always available in the river. Moreover, with the construction and commissioning of the massive Narmada Sagar Project upstream on the Narmada river in Madhya Pradesh in Jan 2004, the downstream SSP has received regulated releases from the upstream dam that stores the monsoon flows and allows gradual release of water across the river. The fact that the RBPH and the CHPH have been generating power in every month of the year and not just the monsoon months implies that there is water through out the year. Thus, a huge quantity of water, almost comparable to the Gujarat's full share of water from Narmada is available at SSP.

It is clear that the current R&R mechanism has completely failed. Any way forward will require a new transparent, participatory and accountable machinery with teeth to stop construction when required

Power Generation at SSP and ISP

MU (MW)

Month	RBPH (IC)	CHPH (IC)	SSP (IC)	NHDC (IC)
0104	0	0	0	55 (250)
0204	0	0	0	71 (375)
0304	0	0	0	66 (375)
0404	0	0	0	29 (500)
0504	0	0	0	23 (500)
0604	0	0	0	76 (500)
0704	0	0	0	95 (625)
0804	0	4 (150)	4 (150)	326 (625)
0904	0	33 (200)	33 (200)	280 (625)
1004	0	38 (200)	38 (200)	100 (750)
1104	0	26.62 (200)	26.62 (200)	114.46 (750)
1204	0	26.14 (200)	26.14 (200)	90.01 (875)
0105	20.97 (200)	0 (200)	20.97 (400)	89.35 (875)
0205	53.87 (200)	12.55 (200)	66.42 (400)	74.17 (875)
0305	35.88 (200)	10.01 (200)	45.89 (400)	46.93 (875)
0405	17.92 (400)	1.69 (250)	19.61 (650)	25.58 (1000)
0505	17.02 (400)	2.73 (250)	19.75 (650)	23.34 (1000)
0605	103.82 (400)	10.05 (250)	113.87 (650)	112.92 (1000)
0705	217.69 (400)	18.95 (250)	236.64 (650)	489.95 (1000)
0805	200.20 (600)	22.30 (250)	222.50 (850)	483.90(1000)
0905	245.40 (600)	29.93 (250)	275.33 (850)	379.62 (1000)
1005	304.57 (600)	16.35 (250)	320.92 (850)	267.72 (1000)
1105	209.91 (800)	17.52 (250)	227.43 (1050)	190.19(1000)
1205	143.49 (800)	20.51 (250)	164.00 (1050)	190.84 (1000)
0106	147.94 (800)	19.54 (250)	167.48 (1050)	167.66 (1000)
0206	114.5 (1000)	16.92 (250)	131.42 (1250)	133.37 (1000)
0306	30.40 (1000)	32.26 (250)	62.66 (1250)	98.88 (1000)

IC: Installed Capacity; NHDC: Narmada Hydroelectric Development Corp; ISP: Indira Sagar Project; MU: Million Units; MW: Mega Watts

Source: Central Electricity Authoriy, www.cea.nic.in Monthly Generation Reports

One can see from the above table that since Aug '04, the CHPH at SSP has produced power in every single month, except Jan '05. In Jan '05, while CHPH could not generate power due to breach in SSP main canal, the RBPH did produce 20.97 MU power. This means that every month since Aug '04, the level of water in SSP reservoir has been above 110.2 m and there has been sufficient water in the river for diversion

of water into the SSP canal through CHPH. Even in Jan '05, since RBPH produced 20.97 MU of power, it means that level of water in SSP reservoir was above 110.64 m.

This is further substantiated by the figures in the last column in the above table, where the power generation at the upstream Indira Sagar Project on Narmada in MP is given. Here we can see that ISP has been producing power every single month since Jan '04 when power generation at ISP was commissioned. It should be noted here that ISP has a greater storage capacity and releases water into the river after power generation, most of which is available at the downstream SSP. Thus regulated, predictable water has been available at SSP every month (actually every day, we can show this if we are given the CHPH, RBPH and ISP daily power generation figures since Jan '04), for release into the canals and to be used for irrigation or water supply in Gujarat since Aug '04 at least. Thus the contention of Gujarat that reliable or regular water supply from SSP dam at 110.64 m is totally wrong.

In every month since Aug '04, the level of water in SSP reservoir has been above 110.2 m and there has been sufficient water in the river for diversion of water into the SSP canal through CHPH… Gujarat has been unable to use even 10% of that water for irrigation and water supply…

Moreover, there is a huge water storage of 366.5 crore cubic meter at 110.64 m and 260 crore cubic meter at 100 m. SSP has been using that water since 2000-01, first by pumping water from existing reservoir into the canal, then since Aug '02 through IBPT and since Aug '04 through CHPH and this water has been used for water supply and irrigation, besides allowing the water to flow into rivers like Sabarmati and into lakes in Gujarat. Thus contention of Gujarat that no usable water is available when SSP height is at or below 110.64 m is totally wrong.

This reality therefore clearly dictates that the height of the Dam be paused at the present level, till the rehabilitation of all the oustees who would be affected at 121.92 M is satisfactorily completed as required under NWDT award and Supreme Court orders. This time should be used by Gujarat to complete their canals, water pipelines and other infrastructure needed to deliver the water which is already available and which would be available at the increased height.

CHPH in 2005-6 produced 208.65 MU power. This means that if on average the reservoir level remained around 11.64 m (it could have gone up slightly some times in Monsoon and could have gone down lightly in summer) and that power generation efficiency is 90% (that is 90% of the potential energy is converted into power) than we see that at least 3.80 MAF water had flowed into SSP canal during 2005-06 even if no water had flown through IBPT. In fact the efficiency is more likely to be about 80%, in which case, at least 4.28 MAF water had flown into canals during the year. This is even more than the 3.5 MAF water claimed by Gujarat when the clearance was given to increase the height of the dam to 110.64 m. And this water was available almost on daily basis. However, Gujarat has been unable to put even 10% of this water to use as is clear from the area irrigated in 2005-6 (57 000 ha) and water supply provided during 2005-6 (2044 villages and 57 towns). Thus there is no justification in allowing the increase in the dam height even from benefits point of view.

Way forward From rehabilitation point of view, any credible independent assessment would show (as did the latest one by the Group of Minister, even though only through a snapshot visit) that rehabilitation is lagging far behind the norms set by the Narmada Tribunal, the Supreme Court orders and the governments' accepted policies. If the signal is to be sent from the system (including the govts, the judiciary and others) that indeed there is some value for the law of the land and some value for the people of this country, than minimum accepted step, in view of the above situation, would be to ask for a pause in the dam construction. In the meantime, firstly, a credible mechanism (that is transparent, accountable and participatory) is put in place to ensure just and proper rehabilitation. The initial step in this regard would be to put up a village wise list of the all the affected families affected at 110.63 m and 121.92 m, when they have been given land, how much land has been given, where they have been given land, when did the affected family take possession of the land, and when and what civic amenities were provided at such sites, on the government websites.

This reality therefore clearly dictates that the height of the Dam be paused at the present level, till the rehabilitation of all the oustees who would be affected at 121.92 M is satisfactorily completed as required under NWDT award and Supreme Court orders. This time should be used by Gujarat to complete their canals, water pipelines and other infrastructure needed to deliver the water which is already available and which would be available at the increased height. They should also use this time to complete the installation of the remaining power generation unit/ turbines and complete the infrastructure of the power stations.

SANDRP

Narmada: Abandoning the displaced

Ramaswamy R. Iyer (Former Secretary, Union Ministry of Water Resources)

The Supreme Court judgment of October 2000 and March 2005 reiterated a clear link between rehabilitation and construction for the future. That is now sought to be changed.

Implicit in the appointment of a Committee to look at the status of rehabilitation work in the Narmada valley is the acknowledgement by the Government of India — or at least a suspicion on its part — that all is not well on the rehabilitation front. Clearly, the Soz report has not been in vain. However, if that were so, the construction work should have been stopped pending the determination of the actual position. This logically follows from the requirement that rehabilitation has to be completed six months prior to submergence. The fact that construction has gone far ahead of rehabilitation constitutes an illegality.

Some may well feel that construction can be allowed to proceed and that rehabilitation can be separately attended to and the backlog cleared, but that is not the legal requirement emerging from the Tribunal's Award and the Supreme Court's judgment.

One recalls that the immutability of the Tribunal's award had been proclaimed in ringing tones in the Supreme Court's judgment of October 2000. That judgment itself reiterated a clear link between rehabilitation and construction for the future. All that is now sought to be changed. Why?

For whatever reasons, the Prime Minister did not stop the work. Even the Supreme Court satisfied itself with the observation that it may have to stop the work at some future time. The learned judges warn the govts not to present the Court with a *fait accompli*, but it was entirely possible for the Court to have disabled that possibility: why did they not do so? The new group has now been asked to look into the matter, the intention being to bring rehabilitation up-to-date within the next few months. What does all this add up to?

Pouring concrete is "development," good politics, non-negotiable. The infliction of hardship on the people, the non-fulfilment of promises made to them, the clear departure from the prescriptions of the Tribunal and the Supreme Court, are no doubt regrettable, but these things happen…

The answer is clear: (i) an acceptance of illegality, (ii) an amnesty scheme for all failures so far (that is "oversight" indeed!), and (iii) a clear de-linking of construction from rehabilitation. The last point amounts to a rewriting of the Tribunal's award. One recalls that the immutability of the Tribunal's award had been proclaimed in ringing tones in the Supreme Court's judgment of October 2000. That judgment itself reiterated a clear link between rehabilitation and construction for the future. All that is now sought to be changed. Why?

Again the answer is clear. Pouring concrete is "development," good politics, non-negotiable. The infliction of hardship on the people, the non-fulfilment of promises made to them, the clear departure from the prescriptions of the Tribunal and the Supreme Court, are no doubt regrettable, but these things happen; one should take a practical, pragmatic view of these things. It is all very well to take a tough stand on demolitions of unauthorised construction in Delhi, but stopping unauthorised construction on a dam is a different proposition altogether.

The pari passu principle In media articles and interviews, some commentators have offered their readings of the *pari passu* principle. Let me explain how this expression gained currency. In 1985-86, the Ministry of Water Resources and the Ministry of Environment and Forests (T.N. Seshan as Secretary, MoEF, and myself as Secretary, WR) were discussing whether the SSP was ripe for a clearance. The Ministry of Water Resources was arguing for a strictly conditional clearance to the project, but the MoEF felt that once a conditional clearance was given, construction would proceed apace and other things such as environmental and rehabilitation measures would become secondary and be neglected. It was in that context that I suggested that such a possibility could be prevented by stipulating a strict *pari passu* condition such that construction is not allowed to outpace environmental and rehabilitation work. The idea was that the pace of work on environmental and rehabilitation measures would determine the pace of work on construction.

Unfortunately, the *pari passu* principle was subsequently misinterpreted and turned on its head. The people who wanted to get ahead with the project argued that the building of the dam and the filling of the reservoir were slow processes that would take many years, and that there was plenty of time to take care of environmental and rehabilitation matters as the construction work proceeded. This meant (a) that the sense of urgency on

the environmental and rehabilitation aspects was lost, and (b) that it was the pace of construction that would determine that of environmental and rehabilitation work and not *vice versa*, reversing the relationship that had been originally intended.

The *pari passu* principle (in the new sense) was severely attacked by the Morse Commission and by Baba Amte. They also questioned the very idea of a conditional clearance. Later developments, that is, lapses and non-compliance with every one of the conditions when reviewed in 1993, seemed retrospectively to prove Mr. Seshan right and me wrong in our 1985-86 discussions. The *pari passu* principle as originally intended most definitely implied that in the event of failures on the rehabilitation front construction work must stop. The authority to proceed with construction work disappears if work on the environmental and rehabilitation aspects lag behind. (In fact, faced with such failures, the MoEF would be justified in withdrawing the conditional clearance.) There can be no other meaning to "conditional clearance."

It is implied "It is all very well to take a tough stand on demolitions of unauthorised construction in Delhi, but stopping unauthorised construction on a dam is a different proposition altogether."

In fact, it is not even necessary to invoke the *pari passu* clause. In terms of the Tribunal's award and the Supreme Court's judgments, land must be allotted one year before submergence and rehabilitation completed six months prior to submergence. There is simply no scope here for construction work to proceed regardless of the state of the rehabilitation work. The October 2000 judgment (profoundly unsatisfactory as it was) did clearly say that further raising of the dam height must at every stage be based on the progress of rehabilitation work. (I am not quoting the exact words.)

In justification of proceeding with the project, it has been argued that each day's delay adds a huge sum to the cost of the project. This is a familiar point. The implicit assumption here is that the project was well-formulated and rigorously scrutinised, that every relevant aspect was duly taken into account, and that all affected categories were taken into confidence and their concerns dealt with, prior to the approval of the project. If so, delays are certainly undesirable.

However, if during the course of implementation of a project, it becomes clear that there were serious flaws in the conception and formulation of the project; that important aspects had been overlooked; that new developments have emerged that call the basics of the project into question; that many categories of project-affected persons (PAPs) had not been consulted or even identified at the project-formulation stage; that the project would cause much more misery and inequity than had earlier been foreseen; or that the project as originally conceived was simply no longer viable; under those circumstances, should we still proceed with the project on the theory that "there must be finality at some stage," or "there cannot be endless reviews"?

Let me take the argument against delay and turn it around: have those who are worried about project costs asked themselves what each day's delay in rehabilitation means (in money and pain) to the project-affected people?

It seems that the executive and the judiciary subscribe to the proposition that the infliction of injustice and misery on the project-affected people must be accepted as the "cost" of development.

The *pari passu* principle as originally intended most definitely implied that in the event of failures on the rehabilitation front construction work must stop. The authority to proceed with construction work disappears if work on the environmental and rehabilitation aspects lags behind. (In fact, faced with such failures, the MoEF would be justified in withdrawing the conditional clearance.) There can be no other meaning to "conditional clearance."

In terms of the Tribunal's award and the Supreme Court's judgments, land must be allotted one year before submergence and rehabilitation completed six months prior to submergence. There is simply no scope here for construction work to proceed regardless of the state of the rehabilitation work. The October 2000 judgment (profoundly unsatisfactory as it was) did clearly say that further raising of the dam height must at every stage be based on the progress of rehabilitation work.

THE SUPREME Court's Order in the Narmada case on May 8, 2006 is completely unjustified. Let us take note of some indisputable points. First, the requirement that rehabilitation must precede submergence is beyond question: it follows from the Tribunal's Award and the Supreme Court's own earlier orders in this case. The proposition of construction being conditional on

rehabilitation was re-affirmed in the judgment of October 2000.

Secondly, there is no doubt whatever that rehabilitation, even with reference to the dam-height already reached, is in fact incomplete and poor. The Report of the Group of three Ministers was a severe indictment of the state of rehabilitation. Even assuming there were some errors in the report that need correction, it is clear that all is not well on the rehabilitation front. The extent of failure might be in dispute; but not the fact of failure.

It follows from those two propositions that work on the dam must be stopped, rehabilitation completed, and then construction resumed. If construction has run ahead of rehabilitation, as is in fact the case, this constitutes an illegality in terms of the Tribunal's Award and the Supreme Court's earlier orders and judgments.

The Supreme Court now wants to wait for the Oversight Group's report, the results of the sample survey, and the study of that material by the Prime Minister. It proposes to hold the next hearing in July 2006. One has no quarrel with any of that. What is not understandable is the court's disinclination to stop the construction until the next hearing. At one stroke, the court has done something unthinkable: it has de-linked construction from rehabilitation. It has gone against its own earlier orders and re-written the "immutable" Award of the Tribunal.

If in July the court finds that there have indeed been failures in rehabilitation and that the continuation of construction was illegal, what will it do? Will it shrug its shoulders and accept the fait accompli?

I was about to say the order was illegal and unjust, but that would be wrong: by definition the Supreme Court cannot do anything illegal or unjust because what it delivers is ipso facto justice, and what it lays down is ipso facto law.

The Supreme Court's Order in the Narmada case on May 8, 2006 is completely unjustified. It seems that the executive and the judiciary subscribe to the proposition that the infliction of injustice and misery on the project-affected people must be accepted as the "cost" of development. At one stroke, the court has done something unthinkable: it has de-linked construction from rehabilitation. It has gone against its own earlier orders and re-written the "immutable" Award of the Tribunal.

Let me state my point differently: what was injustice and illegality till the morning of Monday, May 8, 2006 ceased to be unjust or illegal by that afternoon by virtue of the Supreme Court's order.

While the judgment of October 2000 was far from satisfactory, it did seem at least to hold out a tenuous hope of future justice. The present order extinguishes that hope, and makes the denial of justice absolute.

The project-affected people in the Narmada Valley have been abandoned by the State governments and also the Central government.

It now seems that the executive and the judiciary share a particular understanding of "development" and subscribe to the proposition that the infliction of injustice and misery on PAPs must be accepted as the "cost" of that development. Project-affected people must now reconcile themselves to the fate ordained for them.

The establishment is now in a position to say a word of farewell to those who are being abandoned. Echoing Nehru's words to Assam in 1962, it can say unctuously, "Our hearts go out to the people of the Narmada Valley."

(From articles by the author in the Hindu on May 1 & May 9, '06)

Gujarat Villages show the alternative solutions A number of villages in Gujarat have shown how problems of serious water crisis can be solved through roof top rainwater harvesting. In Mota Sakhpura village in Sayla taluka in Surendranagar district, there was a time when people had to struggle to get a glassful of water. The groundwater level had gone down to great depths and had become saline in recent years. In the beginning there was hesitation in taking up roof top rainwater harvesting as people thought the water stored over long periods would be stale and unhygienic. But today people storing at 72 different places the water collected in monsoon that lasts through the summer and people are happy using the same. People have realized the multiple benefits of roof top rainwater harvesting.

The story of Moti Morsal village in Chotila taluka of Surendranagar district is also eye opening. Here too onset of winter would signal water scarcity and in summer people had to fight to get sufficient drinking water. The women of the village took lead in taking up roof top rainwater harvesting. Similar is the story of Tramboda village in Chotila Taluka. After adopting roof top rainwater harvesting, women do not have to walk two kms to get water. Similar techniques of rainwater harvesting have improved the farming in a big way. Migration of people to look for employment is a thing of the past. The freedom from thirst here is also connected with women's liberation here in a number of ways. (Charkha Features 300506)

Dangers of Knowledge Resistance

Rajni Bakshi

Calling the attention of all those who think the Narmada controversy is just a tussle between development and human rights. It is more significantly a portent of why India may yet miss its chance to be truly great country.

Firstly, the current stand-off is primarily about flagrant abuses of the law by the keepers of the law. Various agencies of govt are colluding to facilitate further construction of the dam without first providing the mandatory rehabilitation to every affected family. Can India truly rise if such failures of basic governance persist?

Secondly, the Sardar Sarovar dam could have provided substantial benefits at a lower height. Yet the bureaucracy, the political leadership and the business elite together consistently refused to consider modifications that would improve the project's cost-benefit ratio in both monetary and environmental terms. Can a society with such high levels of knowledge resistance hope to become a world power?

Painful as the Narmada situation already is, it will begin to look like a picnic if such violations of law remain the acceptable way of running development projects. Recall the Jan 2 firing upon protesters at the Kalinga Nagar in Orissa. The police bullets killed 12 adivasis, many of them hit in the back as they retreated. Subsequently, at least one MP from Orissa lamented that India still does not have a coherent national policy on displacement.

This is a stark reminder that most development projects in India have been effectively illegal because citizens have been evicted from their homes and lands without full rehabilitation. Lodging this fact in our consciousness is one of the Medha Patkar's seminal contributions.

Why should we care about ensuring legal development? One obvious, selfish, reason is that if the rule of law can be manipulated and applied selectively then no person or property is secure. This is what we learnt from the tragedy of the Jessica Lal case and the state of Gujarat's refusal to deliver justice to victims of the communal carnage. A world class economy simply cannot be built on such quicksand.

The biggest obstacle to this is the habitual knowledge resistance of not only our policy makers but also segments of the corporate sector. This is why the Narmada Bachao Andolan's demand for a judicious and comprehensive review of the plan for Narmada valley development was consistently denied. This happened despite a mountain of information about how water resources can be maximized in more economically, socially and ecologically sustainable ways.

The World Commission on Dams, an international, multi-stakeholder exercise, was a signal of creative rethinking on these issues. The commission, which included policy makers, technical experts, corporate executives and environmentalists, produced a nuanced report in 2000 based on hearings held across the world. The Indian govt refused to participate in the process and later refused to take the report seriously. A similar response greeted a rigorous critique of the Bhakra Nangal dam by Shripad Dharmadhikari, a graduate of IIT, Mumbai.

In the mid-1990s, Kartikeya Sarabhai's Centre for Environment Education published an engineers' proposal on how the Sardar Sarovar project could be modified for much more wide spread benefits. No one expected that the proposal would be accepted as is. But that it should simply fall through the floor boards, like an irrelevant spec of dust, was inexplicable. It was in despair over this reality that the World Commission on Dam's Vice-Chairman, L.C. Jain said "I fear that we have become a knowledge resistant society."

This is why the public discourse is still stuck in the frustrating dead-lock of development vs. displacement. Of course, some displacement is inevitable in certain projects. But a creative combination of state-of-the-art technologies and traditional wisdom can minimize damage and increase benefits. There are even sterling best practices in the private sector which are currently rare and begging to be imitated.

Such innovations remain micro level successes because macro level policy is largely stuck in outmoded concepts. Thus, a gigantic river inter-linking scheme can be considered without first having a comprehensive and ecologically sensitive review of water dynamics on this sub-continent. Even more shockingly, we still do not have a cost-benefit review of the thousands of crores spent on water projects.

These anomalies also signal the short-lived nature of the growth rate we currently celebrate. The economic powers of the 21st century will be those nations which happily marry ecological balance with industrial expansion. This means that we need inclusive, knowledge absorbing decision making processes. Merely piecemeal expansion of renewable energy, water-shed management or wasteland restoration will just not do. Development itself will have to be defined through a triple bottom line – simultaneously providing for People, Planet and Profits.

So the next time the Narmada displaced are in the news, remember that your future is on the line as well. It doesn't matter whether you are for or against big dams. Are you for equality before the law? Are you in favor of breaking through the mental barriers that prevent us from applying knowledge more creatively?

(An abridged version of this article appeared in the Times of India 030506)

SRI Update

Purulia (W Bengal) According to a report by PRADAN active in Purulia district in W Bengal, the results of the SRI in the area has been very encouraging in 2005. The average productivity was high: 7.7 T/ ha in spite of high incidence of disease and pest attack coupled with dry spell, both during transplanting and in the grain-filling stages of the crop. 90% of the farmers had yields above 5 T/ ha, around 2.5 times the district average, with 60% of the farmers recording yields in the range of 5-9 T/ ha. The highest recorded yield was 16 T/ ha.

This year as the majority were new farmers, the average area/ farmer was below 16 decimals (one-sixth of a ha). It has been documented that with an increase in plot size under SRI, the productivity did not diminish, as was the general perception among farmers before. This leaves scope for each farmer to bring more land under SRI.

Summary Data on Yield

Yield Range (t/ha)	No. of families	%
1 to 3	5	3.1
3 to 5	13	8.0
5 to 7	48	29.4
7 to 9	52	31.9
9 to 11	33	20.2
>11	12	7.4
TOTAL	**163**	**100**

Per Farmer Area under SRI:

Area Range (decimals)	No. of families	%
<16	88	54.0
16-32	40	24.5
32-48	19	11.7
>48	16	9.8
TOTAL	**163**	**100**

Andhra Pradesh The demonstrations of SRI, confined to 15,000 plots last year, would be increased to 32,000 plots in 2006-7 with a subsidy of Rs 4 crores. (The Hindu 030506)

ICRISAT Soil biological studies in AP Studies on soil properties and yield assessments were made by ICRISAT scientists on fields of 27 farmers during 2005 kharif in Andhra Pradesh. Root studies (root mass and root length density), done for the first time on fields of 12 farmers, indicated that rice roots from SRI plots were more active (indicated by whiter colour) than those from conventional rice. Root length and mass studied on dugout plants were significantly higher for SRI plants when calculated on per plant basis but similar when converted to area basis. This was due to the fact that there were 15-plants/sq m in SRI and 38-plants/sq m in conventional rice. (WWF Dialogue April 2006)

Myanmar In a study by Humayun Kabir & Norman Uphoff on the results of a four-year evaluation of introducing the SRI in northern Myanmar through a Farm Field School methodology between 2001 and 2004, the experience of 612 farmers who had participated in 30 FFSs was studied, along with that of farmers in the same communities who had not gotten FFS training but who learned about SRI through farmer-to-farmer interaction.

Average SRI yield on FFS study-fields was 6.4 T /ha compared with average farmer yields of 2.1 T /ha using conventional means. Subsequently, even without the full use of SRI practices, average production on farmers' fields went from 2.0 T /ha per FFS household (pre-training) to 4.2 T /ha (post-training). To assess benefit-cost relationships realistically (because monetary prices and exchange rates were volatile during this period), all costs of production were converted into physical volumes of rice. Net production of rice/ ha before FFS training averaged 285 kg, only marginally profitable, whereas with FFS/ SRI training, this went up to 4,630 kg, a huge increase. In physical terms, the cost of production/ T fell from 868 kg/T of rice produced conventionally to 283 kg/ T using SRI methods.

Tracking rice yields of FFS participants after they had finished their training showed that SRI rice yields continued to go up even upto three years after the schools were concluded. Further, the use of SRI spread effectively. FFSs trained about one-third of the farmers in a given community; by the third year after training, almost 100% of farmers in the community were using SRI methods.

Other innovations promoted were adoption of better-suited rice varieties and selecting better-quality seed. These two innovations were compared with SRI effects, separately and jointly. These other improvements added 18-28% to baseline yield, and when used together they added 69%. Used by itself, SRI added 142% to yield above the baseline. However, when all three sets of practices were used together, the increase was 253%, demonstrating synergy among practices.

Madagascar R. Emmanuel in the Ministry of Agriculture, Livestock and Fisheries, Madagascar reports that rice yields with "improved" methods that rely very much on purchased inputs are 3.5-6 T /ha in Madagascar, whereas yields with SRI are "up to 10 T /ha (or more in some cases)." that in each of the last three years, when the Ministry of Agriculture organized rice competitions to promote rice production in the country, there have been contests at regional and national levels based on yield. In all three years, the winning farmers in each of the 22 regions and the best farmer at national level have been farmers who practice the SRI. In a separate communication, the Minister of Agriculture reported that over 200,000 farmers are now using SRI in Madagascar, with SRI yields averaging 6 T. This is three times the national average, and the average yield is equal to the top yield with more costly, input-dependent methods.

Indonesia Over the past three years, a major donor-funded irrigation project in E Indonesia has evaluated the SRI to assess its potential to reduce demand for

irrigation water while rewarding farmers with higher production and incomes. This paper reports the results and conclusions from this assessment. In summary, comparison trials managed by 1,849 farmers on 1,363 ha and supervised by project staff have given an average SRI yield of 7.23 t/ha compared to 3.92 t/ha with conventional methods, an 84% increase. Water saving has been assessed to be around 40%, accompanied by an average reduction in costs of production per ha of >25%. (Paper presented at IRRI, March 2006 by the team leader of consultant for JBIC ODA loan for Irrigation in Indonesia)

International Dialogue on Rice & Water

An international dialogue on water saving methods was held at the International Rice Research Institute, Los Banos, Philippines from 6-8 March 2006 involving key international development agencies, research institutions, think tanks, regional bodies and professional organizations, besides farmers and non govt organizations.

The dialogue involved WWF, the UN Food and Agriculture Organization (FAO), two international agricultural research centres (IRRI and ICRISAT) and local hosts the Philippine Rice Research Institute and the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development. This was a very respectable and even formidable set of co-sponsors, as Prof Norman Uphoff of Cornell University noted.

Prof Uphoff has noted in April 2006 issue of WWF's *Dialgue*, "From the opening keynote by Undersecretary Fortunato de la Peña from the Department of Science and Technology (DOST), who spoke approvingly of SRI results in the Philippines, much of the specific discussion of water-saving opportunities revolved around this methodology. WWF reported on the evaluation of SRI methods it sponsored in the Indian state of Andhra Pradesh during the 2004 summer season. This study conducted by the state's agricultural university documented a 21.3% increase in yield accompanied by reduced irrigation applications, reporting that a similar study in Tamil Nadu calculated almost a four-fold increase in the productivity of irrigation water (kg of rice produced per cubic meter of water). The head of India's Directorate for Rice Research reported on several years of all-India evaluation where SRI yield increases were in the range of 7-42% (with hybrids showing an increase of 46-48%) while water saving was 20-24%. SRI evaluation in Eastern Indonesia reported by a Nippon Koei project engineer, based on 1,849 trials on 1,363 ha over three years, showed an average yield increase of 84% with 40% reduction in irrigation water use, and over 25% decrease in costs of production. The resulting increases in farmers' net income from lightly irrigated rice production made water saving very profitable."

DAMS

SC on UP appeal for repair of Gangao Dam in PTR

Hearing an appeal by UP irrigation Dept for repairs of Gangau dam in Panna Tiger Reserve in MP, the Supreme Court granted permission subject to a number of conditions, including the following.

"i) The labour camp will be located outside the PTR/ forest area in village Bhusor or at any other convenient place approved by the FD, PTR. As far as possible only local unskilled labourers will be used from the villages around the PTR. Adequate arrangement for the supply of fuel wood from outside the boundary of the PTR to the labourers in the camp shall be made.
ii) The repairs of the existing road will be undertaken as per the specification approved by the Field Direction, PTR. In no case, black topping of the road will be permitted.
iii) Felling of trees, blasting of any type, digging of soil, or removal of stone from the PTR/ adjoining forest area shall not be permitted. However, salvaging of stones from the damaged structure and use of silt obtained by de-silting the reservoir may be permitted by the FD, PTR.
iv) The details of the staff, the number of unskilled/skilled labourers, vehicles, machinery etc. to be used in the repair works along with the time frame for the repair will be made available in advance to the FD, PTR for his approval.
v) the repair works shall be carried out only between down to dusk."

The order warns, "in case of violation of any of the above conditions, the work will be liable to be suspended by the FD, PTR, with prior approval of the Chief Wild Life Warden, Madhya Pradesh Forest Department."

According to the report submitted by the Central Empowered Committee, following heavy rains and floods during July '05 - parts of the dam got damaged which required immediate heavy repairs. However, it is strange that till end of April 2006, just two months before the monsoon, the repairs have not been completed. The Court has directed UP to file an affidavit "as to what steps were taken from July, 2005 for carrying out the repairs and why till date repairs have not been effected" in four week. The I.A. has been put up for listing in Aug '06. (Forest Case Update, April 2006)

It may be recalled that the Greater Gangau dam is to be constructed on Ken River as part of the proposed Ken Betwa River Link project, about 2.5 km upstream of the existing Gangau dam. National Water Development Agency that has been trying to get the Detailed Project Report of the link, as per the MOU signed in August 2004. However, a part of the area to be surveyed falls under the PTR and NWDA has been trying to get permission for the same without success.

PIL on Palar Dam in SC A writ petition has been filed in the Supreme Court by the Palar Cauvery River Linking Awareness Committee against the construction of a dam on Palar river proposed by Karnataka. The SC has asked the petitioner to make Karnataka and Centre parties in the petition and adjourned the hearing to July '06. Another petition by the Tamil Nadu government on the same issue would also come up for hearing in July. The petition claims that the proposed dam near Kuppam would deprive the people of Tamil Nadu of the Palar river. It says that the dam would also violate a 1892 agreement between the states under which no water could be obstructed, diverted or stored without the consent of the downstream state or region. It also feared that the dam would submerge eight villages and displace about 3 000 families. (The Hindu 150506)

Bharat Nirman – Irrigation Component Plan Under the Irrigation Component of Bharat Nirman, the target of creation of additional irrigation potential of 1 crore ha in 4 years (2005-6 to 2008-9) is planned to be met largely through expeditious completion of identified ongoing major and medium irrigation projects. Irrigation potential of 42 lakh ha is planned to be created by completing such ongoing M&M projects.

- There is a definite gap between irrigation potential created and the potential utilized. Under Bharat Nirman it is planned to restore and utilize irrigation potential of 10 lakh ha through implementation of extension, renovation and modernization of schemes along with command area development and water management practices.
- There are considerable areas in the country with unutilized ground water resources. Irrigation potential of 28 lakh ha is planned to be created through ground water development.
- The remaining target for creation of irrigation potential of 10 lakh ha is planned to be created by way of minor irrigation schemes using surface flow.
- 10 lakh ha irrigation potential is also planned by way of repair, renovation and restoration of water bodies and extension, renovation and modernization of minor irrigation schemes. (http://wrmin.nic.in/bharatnirman/index.htm)

Dams Decommissioned in US In 2005, 56 dams were removed in the US, down from 65 in 2004. On August 31, 2005, the US federal govt announced a new Open Rivers Initiative, under which local communities will receive funding and technical expertise to remove small dams. (IRN overview of dams in 2005)

Bhakra, Hirakud Affected still not resettled According to separate reports from Himachal Pradesh and Orissa govts, the people displaced by the Bhakra and Hirakud Dams in the 1950s are yet to be properly resettled as per the norms accepted at that time. Both govts have set up committees to complete the long pending tasks. This shows the utter disregard in India to proper resettlement and rehabilitation of the people displaced in the name of development.

Athirapally: People win another battle
High Court orders another Public Hearing

A Division Bench of the Kerala High Court on March 23, '06 quashed the environment clearance given by the Union Ministry of Environment and Forests for setting up a 163 MW hydroelectric project at Athirappilly across the Chalakudy River in Thrissur district. The Bench comprising Chief Justice V.K. Bali and Justice S. Siri Jagan quashed the clearance as it found that no public hearing had been conducted after the publication of the environment impact assessment study report prepared by the Water and Power Consultancy Services Ltd. While directing the State govt and the Kerala State Electricity Board to conduct the public hearing afresh after publishing the environment impact assessment report stated to have been prepared by the Kerala State Electricity Board, the Bench ordered that the exercise should be completed within two months. The court issued these directions while allowing writ petitions field by the Athirappilly grama panchayat and others. The Bench said that the govt was bound to publish the EIA report done by the WAPCOS and conduct a public hearing. According to the petitioners, the EIA conducted earlier by the Tropical Botanical Garden and Research Institute had not been published. The clearance was granted on the basis of the EIA by the WAPCOS.

The indefinite Satyagraha against the proposed Athirappilly HEP has been called off on March 25, '06 on the 93rd day after the HC judgment. A procession of more than 100 people and children followed by a public meeting marked the occasion.

Victory for the people The people of Kerala and those in the project area in particular, lead by the Chalakudy Puzha Samarakshan Samity have been campaigning against the ill conceived project for many years now. They had earlier won a case in the Kerala High Court in response to PILs including two by CPSS persons. In its order on Oct 17, 2001, a division bench of Justice P K Balasubrmanyan and Justice M Ramachandran asked KSEB to conduct a full and proper EIA, hold public hearing and then apply for a clearance for the project. That order was also a serious indictment for the MoEF as it had given clearance to the project, bypassing legal requirements. In that order the HC had also directed the KSEB to ensure optimum generation from existing installed capacity and to minimize the T&D losses & theft. That direction remains to be implemented.

MoEF in the dock The High Court order is a huge indictment for the Union Ministry of Environment and the Forests as it has been regularly and rampantly violating the legal norms in the EIA notification. The ministry's misdeeds stand exposed as the clearance given by the ministry has been cancelled by the High Court. There is an urgent need to punish the officials of the ministry who indulge in such violations. (The Hindu 240306, Chalakudy Puzha Samarakshan Samity)

HYDRO

Karcham Wangtoo gets REC funds In a move that raises many questions, the Rural Electricity Corporation will provide a loan of upto Rs 750 crores in association with ICICI bank for the controversial Karcham Wangtoo HEP in Himachal Pradesh, even as the local communities continue to strongly oppose the project. REC's funding of the project is questionable as the project does not fit into the Rural Electrification, the core mandate of REC. This is particularly galling with the news in the core concern area is so bad for REC. (Power Line 0406)

Controversial Dandeli HEP proposal resurfaces The Murdeshwar Power Corp Ltd had submitted a new proposal for the 18 MW Dandeli HEP on Kali river in Karnataka after two earlier unsuccessful attempts. Its earlier proposals were rejected in 2002 and 2004 for a number of reasons, including submergence of forest land, serious impact on biodiversity, destruction of water rapids and eco tourism potential, high cost of the project (over 180 crores) and plagiarism of the EIA reports by Ernst & Young and TERI. The new proposal now would submerge 57.51 ha of forest land. Kali river basin already has five large hydro projects, including the Supa Dam. In 1987, when the Union Ministry of Environment and Forests gave clearance to Kodisalli power project on Kali nadi, one of the conditions stipulated was that "no further projects involving diversion of forest land would be undertaken on Kali nadi or its tributaries". On May 19, 1987, Karnataka govt passed a GO to that effect. The new proposal would violate the GO and the MEF condition. (Front Line 190506)

Ministry of Power to Constitute Hydro Commission With a view to speed up sanction and taking up construction of hydel projects, it is proposed to constitute a specially empowered hydro electric Commission with representation "from the Ministries connected with sanction of hydel projects i.e. Ministry of Power, Ministry of Environment, Ministry of Finance, Ministry of Water Resources etc", says MoP website.

Update on 50,000 MW Hydro Electric Initiative The Prime Minister launched the 50,000 MW hydro power initiative on 24.5.2003. The first part was the preparation of Pre-Feasibility Reports for 162 identified Hydro projects and involved preparation of PFRs by seven agencies covering 16 States and was to be completed by Sept 2004.

MoP website says, "The work is under close monitoring by the CEA and the Ministry of Power. The first 62 PFRs have recently been received and are under scrutiny of CEA. The results have been extremely encouraging and it has been found that there are 21 projects with accumulative capacity of about 10,000 MWs having tariffs around Rs 1.50 per unit. Without waiting for the remaining PFRs to be completed, a decision has been taken to take up DPRs for eventual implementation of the more attractive schemes. Accordingly a provision has been sought from the Planning Commission for providing Rs 150 crores in 2004-5 and Rs 200 crores in 2005-6. The DPRs would take about 2 years to prepare and the issues connected with the speedy implementation of DPRs are being addressed."

BOOT/ BLOT Initiative for private hdyro MoP website says, "One of the main reasons for the reluctance of the private sector to invest in hydel projects is the lack of adequate payment security mechanism, particularly in view of the poor finances of the electricity boards. Under this scheme it is proposed to get projects implemented by CPSUs through joint ventures with private entrepreneurs. In this manner the CPSU provides the cover sought by the IPP for issues relating to payment as well as land acquisition, R&R, security etc. The Note for CCEA was submitted to the Cabinet Secretariat on 281103. The same was returned by the Cabinet Secretariat on 091203 for modifications (comments of concerned Depts, etc). The note has again been modified in consultation with the Integrated Finance Branch of Ministry of Power and will be re-submitted to the Cabinet Secretariat approval by the Minister of Power". (www.powermin.nic.in 180306)

Larji HEP delay to be probed The Himachal Pradesh govt would thoroughly examine all aspects which resulted in delay in commissioning of 126 MW Larji HEP, being executed by state electricity board, leading to massive cost escalation, Power Minister Vidya Stokes said. She said the govt would not shield any guilty person howsoever influencial or highly placed he might be and the guilty would be brought to the book. She said the original cost of the project was estimated at Rs 736 crore which increased to Rs 1 200 crore (increase of 63 %), which was unusual and too high. It may be recalled that state electricity regulatory authority had already held an enquiry and indicted some top officials of the board for serious lapses resulting in time and cost overruns. The per MW installed capacity cost of the project comes to an unprecedented figure of Rs 10 crores. (PTI 040506)

NHPC eyes HEPs in the neighbouring countries The National Hydroelectric Corp plans to take up projects in Myanmar, Bhutan and Nepal. It wants to set up projects with a combined capacity of around 3,400 Mw that may need an investment of around Rs 17,000 crore on a stand-alone basis or through a joint venture with the governments of these countries. In case of a joint venture agreement NHPC plan to have a minimum 51 % stake. The company is interested in the 1 200 MW Tamanti HEP in Myanmar, the 672 MW Mangnichu HEP and the 1,000-Mw Phunasachu I & II HEPs in Bhutan. NHPC is also eyeing the 480 MW Upper Karnali HEP in Nepal. NHPC is not only interested in preparing the detailed project reports but if given an opportunity, would also like to construct them. (Business Standard 110506)

Maheshwar HEP: Environment, Power Ministry Confronted

The Maheshwar Project, one of the 30 large dams in the Narmada valley, is being built in District Khargone in Madhya Pradesh. It was one of the first private HEPs of the 1990s and the Promoters is the Shree Maheshwar Hydel Power Corp, which is part of the S. Kumars group. NBA estimates that it will affect nearly 20,000 families. The installed capacity is 400 MW, but it will produce firm power of only 49 MW. Most of the power will be produced in the monsoon when the state is likely to have surplus power.

When the NBA asked MOEF for details of these lands and for the official definition of Displaced Families, the MOEF responded in writing, saying that all the main Maheshwar files are missing from the Ministry.

The promoters have increased the Project outlay 5 times in the last 15 years, and thus the electricity will be prohibitively costly and the dam is likely to be high cost one like the Enron Project. The Project promoters have criminal proceedings against them. The Project is encumbered by the liability to return the loans of two other S Kumars companies and the equity of the Project has been re-pledged to a govt. FI in MP for the deferred pay-back of those loans. By RBI rules, no public money may be given to such a company.

Protests stop the project Since 1997, when work on the Project began, the affected peasants, fisher-people, boats-people and agricultural workers of the area have waged an intense struggle to challenge and stop this controversial Project. As a result, successive US and German companies – Bechtel in 1997, German companies Bayernwerk and VEW Energie in 1999, US Power company Ogden in 2000 left the Project.

Attempts to restart now The Project remained stopped from 2001 to 2005, as the Project properties were attached due to default on loan and the Financial Institutions had also stopped giving finance to the Project. The Project has now been re-started in 2006 on the basis of many subterfuges. The Project authorities are seeking large loans from the HUDCO, REC, BHEL, equity participation from LIC and GIC and are also seeking that FIs / Banks pick up debentures worth Rs 400 crores through private placement based on a guarantee given by the Power Finance Corp and a counter-guarantee to be given by the govt. of MP. Now the affected people are on the streets to stop the Project that is flawed on technical, social & financial grounds.

Protests in May 2006 Over 300 farmers & fisher-people, including women from the 61 villages affected by the dam on May 11, '06 demonstrated before the Ministry of Environment and Forests demanding immediate withdrawal of environmental clearance to the project. In their meeting with the Additional Secretary, MoEF, the representatives said that the environmental clearance to the Project was illegal because the land availability details are false. They said that the Promoters and the MOEF have been ignoring the just claims of the affected.

They said that although the MoEF was aware that the agricultural lands shown to be available for R&R are non-existent, they have not revoked the Environmental clearance. Now that Project work had been resumed, this fraud would lead to a great human disaster. The oustees also stated that the MoEF had willfully and deliberately excluded around 8000 river-worker families from the list of the affected families by misquoting the Rehabilitation Policy. When the NBA asked MoEF for details of these lands and for the official definition of Displaced Families, the MoEF said that all the main Maheshwar files are missing from the Ministry.

The MoEF officials assured that they would locate the files as soon as possible, form a Committee to investigate the veracity of the land claims. They said that if the R&R Master Plan has not been submitted, they would ask the Project work to be stopped.

The displaced people had meetings at REC, HUDCO, BHEL, PFC & other FIs. The officials also asked the NBA to contact the PFC since it is the lead institution for the Project. The PFC and the MoP had asked the FI's to put their money into the Project. HUDCO & REC had been asked to lend Rs 250 crores each. The officials assured that they would look at and respond to all the concerned issues. In the context of all the above, and several other issues such as low infusion of equity by promoters, bar to financing for more than 40% if the total Project outlay by the public FIs, absurd PPA that favors the Promoters, the oustees called on the FI's not to put any money into the Project.

Protests at PFC The affected people on May 12, '06 demonstrated at the office of the PFC. They challenged the PFC to demonstrate that the project is in national interest, has a viable tariff. They asked the PFC for a meeting but PFC refused. They filed a request for file inspection under the Right to Information Act. NBA said that the secretive behavior of the PFC made it clear that there was more to it than meets the eye. It was incomprehensible that the PFC that has already been censured by the CAG of India for disbursing Rs 100 crores to the Project in violation of the necessary conditions was preparing to put another Rs 800 crores into the same Project along with a guarantee to the Project. (NBA 090506, 120506, 130506)

ADB's loan for Uttaranchal Power Sector

Disguised attempt to fund large hydro projects

The Asian Development Bank has approved a $ 300 million loan for Uttaranchal Power Sector, that includes $ 45 m component for small hydro projects. However, major component is to fund transmission lines for a number of proposed large hydro projects that have already seen violations of Indian legal norms in environmental clearance process, including the public consultation process and quality of and access to the Environmental Impact Assessment reports. Thus the ADB is guilty of funding large hydro projects under disguise, without taking the responsibility for the social and environmental impacts of such projects. The ADB is also guilty of being party to the violations happening in these projects.

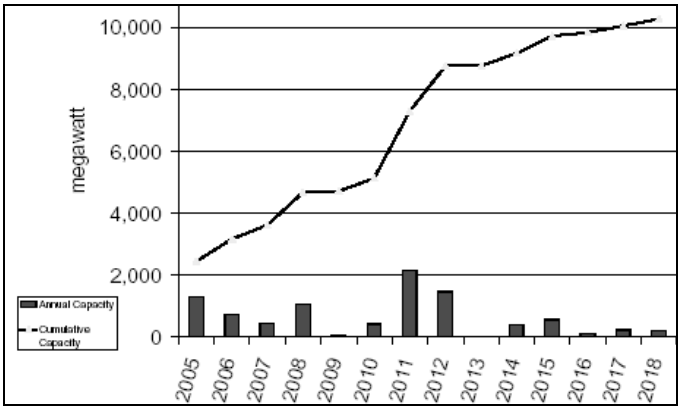
What the ADB President says in its Report and Recommendation to the Board of Directors in March 2006 for the project titled "Proposed Multitranche Financing Facility India: Uttaranchal Power Sector Investment Program" is given in brief below, along with relevant comments. (The full report is available on the ADB website: www.adb.org.)

"SHEPs provide power directly to local grids (at 33 kilovolts), and therefore are integral to meeting rural electrification objectives. SHEPs can be constructed much faster than medium- and larger-sized ones, are environmentally friendly"

ADB Uttaranchal Hydro TA Cancelled in 2004 It may be recalled that earlier May 2004 ADB had approved a TA (IND 38010-01) of USD 0.80 m under the name "Hydropower Development". The TA was intended to fund National Thermal Power Corp to take up studies regarding the Loharinag Pala and Tapovan Vishnugad.

In Jan '05 P Abeygunawardena from ADB informed SANDRP, "The TA was cancelled on 8 Nov 2004 on the request of the National Thermal Power Corporation of India, the Executing Agency of the Project."

The current project report gives no information about this proposal and its cancellation. This is strange, as it is expected that ADB would give full information about the past projects in the area in any project report.



Installed Capacity At year-end 2005, Uttaranchal had installed generating capacity of 1,160 MW, entirely from hydropower plants. Total theoretical potential is estimated at 20,000 MW. Capacity expansions planned through to 2018 total about 10,000 MW. There are 14 projects under construction, totaling 5,525 MW in new capacity by 2010. An additional 4,791 MW are in the development stage, with commissioning due soon after 2010, and an additional 9,090 MW is planned beyond that. Approximately $4 billion in new investment is required for new generating capacity to be commissioned by 2012, most of which will be provided by central public sector utilities, Uttaranchal Jal Vidyut Nigam Ltd and private sector developers. The installed power generation capacity in Uttaranchal is expected to grow as shown in plot below.

This assumes that 1284 MW would have been commissioned in 2005-06 (already proved wrong) and 723 MW to be added in 2006-07, again likely to be proved wrong.

The report claims, "The generation expansion program is dominated by clean energy development in the form of low-carbon generation operations, and energy efficiency improvements in the form of renovation and system loss reduction. While most of the new hydropower capacity during the first phase will come from large (more than 100 MW) and medium (25–100 MW) plants, the program includes small run of river hydropower plants (3–25 MW). Numerous candidate sites have been identified, with a cumulative capacity of around 1,000 MW, about 10% of which is now operating. Independent power producers are expected to develop about half of the small hydropower plants. SHEPs provide power directly to local grids (at 33 kilovolts), and therefore are integral to meeting rural electrification objectives. SHEPs can be constructed much faster than medium- and larger-sized ones, are environmentally friendly, and are expected to generate tradable carbon credits, with substantial financial upside to the project sponsors." ADB is providing assistance to GOU to develop carbon credit opportunities. If the SHEP investments are not feasible or do not qualify for the CDM, selling emission reduction credits in the second-tier, or voluntary, markets may be possible, the report notes. However, there is good chance that neither of these options may be available as the SHEPs may not pass the criteria for qualifying for these benefits. The project does not even mention this possible or the consequences thereof.

Grant for micro hydro A grant to the Uttaranchal Renewal Energy Development Agency for accelerated

upgrading of micro-hydropower facilities has been separately approved from ADB's regional TA for the Poverty and Environment Program. The grant will partly finance watermill users' associations, with the objective of commercializing locally-owned facilities that produce mechanical and electric power.

Other international aid Uttaranchal has received assistance from the Japan Bank for International Cooperation for the 280 MW Dauliganga HEP (through the NHPC) and from the Canadian International Development Agency and the Canadian Commercial Corp for RMU at the 144 MW Chilla HEP.

This justification, put forward to push large hydro projects in the Himalayan states of J&K, HP and Uttaranchal is entirely unfounded

Up to $300 million loan from ADB under this facility is to help fund the investment program during its first phase. The Multitranche Financing Facility will be converted into individual loans. The utilization period of the facility will be 7 years, upto Jan 31, 2013.

Questionable Rationale The project is based on following rationale, which are questionable if we look at the past experience and current situation.

Assumption "Clean energy and tourism are two important economic growth and poverty reduction drivers. The state has undeveloped hydropower potential estimated at 20,000 MW. Harnessing this hydropower capacity is vital to meet all in-state demand and export power to surrounding states, and support investment in rural and other productive sectors."

Why it is unfounded This is a highly questionable assumption. The predominant mode of realization of the so called potential of 20 000 MW is through large hydro projects and such projects cannot be called clean, as is claimed above. Nor are there any direct link between development of these projects and poverty reduction. On the contrary, such projects are known to be creating impoverishment by displacement and by taking away the resources out of the hands of the rural communities. Similarly, greater consumption of electricity within the state and generation of revenue through export of such power do not necessarily lead to poverty reduction.

Assumption The Northern Region grid has a power deficit that will persist for several years, but that can be cost-effectively ameliorated by developing hydropower in the mountainous states of Jammu and Kashmir, Himachal Pradesh, and Uttaranchal.

Why it is unfounded Firstly, if we see closely, Northern Region do not really need additional large generation capacities, as is also made clear in the CEA's National Electricity Plan of March 2005, quoted by the ADB report. The current generation capacity, when operated optimally, and considering the projects already under construction, the Northern region is likely to not require additional large capacities in short or medium term, when we also take into account the possible imports from Eastern and North Eastern grids and the potential of peak management and demand side management, reduction in T&D losses and decentralised generation options. Thus, this justification, put forward to push large hydro projects in the Himalayan states of J&K, HP and Uttaranchal is totally unfounded.

Questionable projections Let us examine the projection for 2008-09 given in Table 1 a little closely. The Table 1 assumes that installed capacity will cater to peak demand equal to about 75% of installed capacity available. What is the basis for this assumption? If we look at the performance of other regions, we can see that better performance is possible. The Northern grid itself met peak demand equal to over 76.5% of the installed capacity in 2005-06 and trend shown in Table 4 shows that this trend is increasing. It is clear that this assumption is wrong.

Table 1
Load Generation Scenario, 2008–2009

MW

Region	Installed Capacity	Peak Demand	Peak Availability	Surplus/ (Deficit)
Northern	44,300	41,200	33,200	(8,000)
Western	44,500	41,000	33,000	(8,000)
Southern	37,000	35,000	31,000	(4,000)
Eastern	27,000	13,500	24,000	10,500
Northeastern	6,300	1,500	4,500	3,000
Total	**158,100**	**132,200**	**124,700**	**(7,500)**

Table 2
Electricity and peak shortages in Northern India

YEAR	ENERGY IN MU (NET)			PEAK POWER IN MW		
	DEMAND MET	REQUIREMENT	% SHORTAGE	DEMAND MET	REQUIREMENT	% SHORTAGE
1991-2	81624.95	86599.9	5.74	12520	14533	13.85
1992-3	86763	91746.22	5.43	13772	15040	8.43
1993-4	90525	97135	6.8	13714	15633	12.28
1994-5	96323.50	103623.50	7.04	14296	16375	12.70
1995-6	103834.20	110938.26	6.40	15804	17729	10.86
1996-7	108504.70	117906.00	7.97	16109	18201	11.49
1997-8	113929.91	119962.88	5.03	17091	19016	10.12
1998-9	122300.02	128168.04	4.58	18372	20183	8.97
'99-00	128366.54	137412.29	6.58	19341	21083	8.26
2000-1	133389.65	143433.09	7.00	19860	21479	7.53
2001-2	140003.11	148033.72	5.42	21586	22589	4.44
2002-3	142277.59	155409.00	8.45	21767	24031	9.42
2003-4	153633.02	163159.14	5.84	22746	24348	6.58
2004-5	159277.26	175058.22	9.01	24207	26808	9.7
2005-6	168 511	188418	10.6	25200	28154	10.5

www.nrldc.org

Demand Growth % Compound annual growth rates in decade upto 2004-05 has been as follows.

- MU demand met 4.87
- MU demand 5.20
- Peak MW Demand met 4.85
- Peak MW Demand 4.70

It is clear from the above that the peak demand has been growing at slower rate than the growth rate at which peak has been met. This means that the trend is for lower unmet peak demand in future, in spite of somewhat higher unmet peak demand in last two years.

Peak Demand Growth Even if we take the figures of just last five years (2001-02 to 2005-6) we can see that the compound annual growth rate in peak demand has been less than 6%. Even if we assume 6% CAGR for peak demand growth upto 2008-09 (Scenario for this year is given in Table 1), the peak demand in the Northern region in 2008-09 would be 33532 MW, way below the 41 200 MW assumed in Table 1. If we take even higher CAGR of 7% (highly unlikely even if take the behaviour of demand pattern in most recent years), the likely peak demand would be 34390 MW in 2008-09, still a huge 6 800 MW less than the assumption in Table 1. It is clear that the assumptions in Table 1 are exaggerated to justify capacity addition in the Northern Grid and related transmission investments.

Table 3
Installed Capacities in NR

MW

Year	Thermal	Hydro	Gas/Diesel/Wind	Nuclear	Total Installed cap.
1991-92	11462.60	6257.00	1582.00	880.00	20181.60
1992-93	12027.60	6300.50	1844.00	880.00	21062.10
1993-94	12673.00	6463.00	2187.00	880.00	22203.00
1994-95	13170.60	7311.50	2377.00	880.00	23739.10
1995-96	13272.60	7336.50	2377.00	880.00	23866.10
1996-97	13358.10	7645.80	2377.50	880.00	24261.40
1997-98	13358.10	7782.23	7782.23	880.00	24428.30
1998-99	14373.30	7817.40	2407.97	880.00	25478.67
'99-2000	14778.00	7868.18	2693.74	1130.00	26469.92
2000-01	14988.00	8560.22	2841.56	1350.00	27739.78
2001-02	15488.00	8725.22	2851.31	1350.00	28414.53
2002-03	15488.00	8742.74	3181.19	1350.00	28761.93
2003-04	15894.50	10838.04	3219.49	1350.00	31302.03
2004-05	16894.50	10842.59	3588.45	1350.00	32675.54
2005-06	17066.50	11096.79	3586.12	1180.00	32929.41
CAGR	2.72	4.44	4.68	4.87	3.55

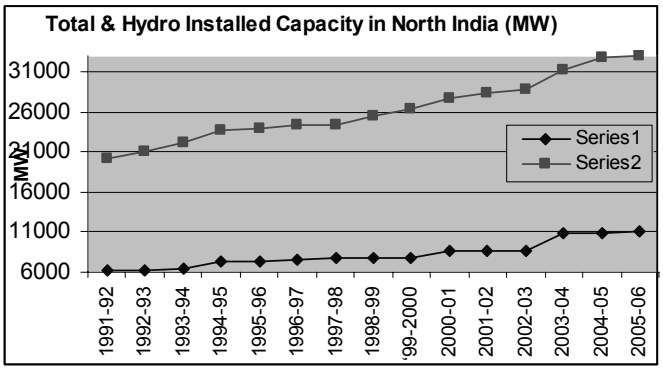
CAGR: Compound Annual Growth Rate, this is for the period 1994-95 to 2003-04.
Source: Official website of the Northern Region load dispatch centre www.nrldc.org, annual reports of various years

We can see from the Table 4 below that the performance of Northern region in providing peak power requirement as % of available installed capacity has been increasing over the last 16 years, though this is still short of what is possible. By working on this performance, it is possible to ensure that existing installed capacities provide greater peak power requirements.

Table 4
Installed capacity vs peak demand met

(MW)

Year	Total Installed cap. (A)	PEAK DEMAND MET (B)	B as % of A
1991-92	20181.60	12520	62.04%
1992-93	21062.10	13772	65.38%
1993-94	22203.00	13714	61.77%
1994-95	23739.10	14296	60.22%
1995-96	23866.10	15804	66.22%
1996-97	24261.40	16109	66.40%
1997-98	24428.30	17091	69.96%
1998-99	25478.67	18372	72.11%
'99-2000	26469.92	19341	73.07%
2000-01	27739.78	19860	71.59%
2001-02	28414.53	21586	75.97%
2002-03	28761.93	21767	75.68%
2003-04	31302.03	22746	72.67%
2004-05	32675.54	24207	74.08%
2005-06	32929.41	25200	76.53%



The Table 1 above also shows that there is an option of importing peaking surpluses from eastern and NE regions, for which transmission systems installation work is in progress. Secondly, the demands projected above are exaggerated if we look at the current demand situation. Thirdly, the scenario does not take into account the option of peak management and demand side management options for the same. Thus, this scenario is not likely to be real and does not provide basis for the proposed ADB project for creating surpluses in Uttaranchal through additional installed capacities. It may also be recalled that a lot of hydro capacity is not used for peak load supply, and a huge option remains on this score. There is also the option of adding hydro capacities at existing dams where no such facility exists. Similarly there is also the option of better output from existing capacities through better maintenance.

Thus, in the investment plan given in the ADB report, following inputs are required:

- ADB: $300.0 million
- Government: $3,060.0 million
- Private sector: $750.0 million
- Other financial institutions: $1045.0 million

Table 5
Uttaranchal Investment Program 2006–2012

	$ Million
Generation	
UJVNL Large Hydropower	700
UJVNL Small Hydropower	335
Central Public Sector Utility and/or Independent Power Companies	3,200
Transmission	550
Distribution	370
Total	**5,155**
Financing Plan	
Domestic	
UJVNL	440
PTCUL	100
UPCL	40
GOU	580
Central Power Sector Utilities	1,600
Private Sector	750
Power Finance Corporation	300
Local Banks, Private Equity, and Capital Markets	245
International	
ADB	300
Bilaterals	300
International Financial Institutions	500
Total	**5,155**

A program for renovation, modernization, and upgrade of existing HPPs has been defined with an estimated cost of about $ 150 million.

The ADB Project, strangely, provides for retroactive financing under individual loans for expenditures incurred 12 months prior to the signing of the corresponding loan agreement, with a ceiling of up to 20% of the loan amount. ADB loans will finance up to 70% of total subproject costs. The minimum amount of a loan request will be $25.0 million.

In 2004 ADB wanted to fund studies for two large hydro projects in Uttaranchal. That project was cancelled mysteriously ten months latter without spending any money. Now ADB wants to fund only transmission component of the project. All this raises many questions, but ADB is not prepared to provide any answers.

Power Sector The Uttaranchal Energy Department is the program's overall executing agency. The Uttaranchal Jal Vidyut Nigam Ltd will be in charge of investments in generation. Power Transmission Corp of Uttaranchal Ltd will be responsible for transmission sector investments.

UJVNL was formed in 2001, shortly after the creation of the state of Uttaranchal. UJVNL was created by separating the assets of Uttar Pradesh Jal Vidyut Nigam based on location. As a result, UJVNL received 9 large and medium hydropower plants, 9 small hydropower plants, and 23 micro-hydro stations with total capacity of 1,130 MW, of which 1,005 MW are operated by UJVNL, 5 MW by an independent power producer, and the rest 120 MW by the National Hydroelectric Power Corp.

UJVNL takes a lead role in developing HEPs greater than 1 MW and manages private sector participation. Private participation is open for more than 40 HEPs of less than 25 MW capacity and 13 HEPs of 25 - 100 MW.

The Uttaranchal Renewable Energy Development Agency takes a lead role for projects of less than 1 MW. It also manages renewable energy projects, including off-grid development, with some support from bilateral donors and non-government organizations.

The ADB report notes that in 2003, state demand exceeded in-state supply by 10.2%. In 2004, this gap decreased to less than 5% even as the Electricity utilization has increased by 10-16% per year since 2000.

High T&D losses The ADB report (p 45) notes that in 2003-04, Uttaranchal had aggregate technical and commercial losses of 44 %. This is way above the norm of 15 % losses.

Further, on page 47 it is stated, "A key challenge is the high level of aggregate technical and commercial losses, which increased during the first 3 years of its operations. However, the trend has been reversing in 2004-05. Commercial losses increased from Rs 981.1 million in 2002-3 to Rs 2,049.5 million in 2003-4 with transmission and distribution losses estimated at 35%."

Considering the number of projects in the state under construction and the scope for improving the generation, peak management, reducing the transmission and distribution losses there is little rationale for additional generation projects suggested in the facility.

Funding transmission lines for large hydro ADB project plans to fund transmission component of the following large Hydro projects:

- Lohari Nag Pala 520 MW NTPC
- Tapovan Vishnugad 360 MW NTPC
- Lata Tapovan 108 MW NTPC
- Pala Maneri 416 MW UJVNL

All subprojects require environmental assessments in accordance with ADB's *Environment Policy 2002*. Category A and B subprojects will require a summary environmental impact assessment and a summary initial environmental examination, respectively, to be prepared and made available to the general public 120 days before approval. EMPs with budgets will be prepared for each subproject.

The ADB report says that the projects associated with the proposed transmission lines to be funded by ADB

are all run-of-river designs. However, this does not mean that these projects do not have destructive potential.

Attempt to escape responsibility? It seems this is ADB's clever attempt to escape responsibility for the adverse social and environmental impacts and questions on economic viability of these projects. ADB earlier tried to fund a TA in 2004 to study feasibility of the first two of the above four projects. However, the TA was cancelled under rather mysterious circumstances.

Now ADB wants to fund the transmission component of four such large hydro projects, each of which has serious social and environmental impacts and questions about their economic viability. ADB stands responsible for all such impacts of these projects.

ADB wants to fund only the transmission component of four large hydro projects, each of which has serious social and environmental impacts and doubts about their economic viability. ADB stands responsible for all the consequences of and violations involved in these projects.

There are also questions about economic and hydrological viability of these projects and again ADB stands responsible for such impacts.

Moreover these projects have already seen serious violations of legal norms regarding public consultation and environmental clearance processes and some of these projects stand questioned in the courts. ADB is becoming party to the violations involved in these projects.

Small Hydro Projects ADB proposes to fund 4 SHEPs under the project:

- Kaliganga-I (Jaltlala and Khunnu Kotimasheswari villages, Rudraprayag district)
- Kaliganga-II (Khunnu Kotimasheswari and Kobilta villages, Rudraprayag district)
- Madhyamaheswar (Girriyagon and Chuni villages, Rudraprayag district)
- Kaldigad (Sangam Chatti village, Uttarkashi district).

Unrealistic assumptions In case of generation benefits, the following assumptions are made:

- Generation for SHP was derived from using 50% plant load factor, 0.50% auxiliary energy Consumption, 0.50% transformer losses & 0.50% transmission losses.
- Incremental generation figures for RMU projects is expected incremental generation provided by UJVNL.

ADB projects average generation at 60% load factor when such projects have never produced power much beyond 40% plant load factor. The projected benefits are clearly exaggerated and projects already seem economically unviable even by ADB's own sensitivity analysis

However, the assumption of generation at 50% load factor in case of non storage small hydro projects is likely to be way off the mark and generation is not expected to be more than 35-40 % PLF as can be seen from generation figures of Uttaranchal Hydro projects over the last four years in Table 6. The assumption of 0.5% transmission losses is also huge underestimate and helps exaggerate the benefits. To assume that all the incremental generation from RMU would be available for sale is also wrong, as there are bound to be transmission losses. Moreover there are also likely to be distribution losses when the electricity is supplied to within state consumers and sale proceeds would be significantly lower than assumed, considering the high T&D losses in Uttaranchal.

In case of transmission projects too the risks are significant: the risk of large hydro projects getting delayed, the risk of lower tariffs and high costs.

Exaggerated generation projections Thus it is claimed that the 29 MW of new generating capacity from small hydro projects at 60% load factor would generate 125.115 MU per annum from 2010-11.

It is claimed that the RMU component would add 10 MW of incremental output and generate at 60% load factor additional 56.5 from 2010-11.

Above claims are unlikely to be achieved. Firstly, as we can see from figure in Table 7, the maximum PLF that Uttaranchal Hydropower projects have achieved is 40.71%. Thus the assumptions of 50% and 60% are wrong and would lead to exaggeration of benefits.

Sensitivity Analysis: Shows projects not viable The variables considered for the sensitivity analyses were a 1-year implementation delay, a 20% increase in capital costs, and a 20% decrease in SHPP and RMU tariffs, and a 1-year implementation delay, a 20% increase in capital costs, a 20% decrease in wheeling charges, and a 10% decrease in energy sales for transmission components. The sensitivity analyses for the two subprojects indicate that both are relatively sensitive to increases in capital costs, tariffs, sales, and energy generation. This shows that the projects are doomed to failure, as the projects are likely to face multiple lags.

Risk of Financial unsustainability is high The report stays that in UJVNL's case, the risks are somewhat higher given that 26 large, medium, and small hydropower are to be commissioned within 10 years, including four SHPPs funded by the ADB. The total

capacity is expected to be 2 597 MW, with an investment amount of approximately Rs136 billion ($3 billion) in UJVNL's pipeline. The uncertainty inherent in identifying adequate financing sources in a timely manner raises concerns about financial sustainability at an institutional level. UJVNL may need to justify its proposed capital investment program and adjust the time of the commissioning schedule to reflect a realistic timetable.

Claims of Participatory Project Design The report claims (para 64), "During Investment Program design, participatory approaches were undertaken, including consultations with representatives of communities, local governments, and other stakeholders." Further, (para 72) it claims, "Two rounds of public consultation were conducted that indicated broad support for the Project based on expected economic and social benefits. The SEIA was circulated to ADB's Board on 20 May 2005 and was translated and made available to affected people in the project area. An environmental sector assessment was submitted to ADB on 17 June 2005." However, it is not known, nor clarified as to who were consulted, when, with what information and in what form. The claims look unfounded in absence of these basic details.

Northern grid is like a heavily leaking bucket. What is the point of adding additional generation capacity in such a system without addressing the issue of high transmission and distribution losses? As ADB accepts, such losses were at 44% in Uttaranchal in 2003-04

Social and Environmental issues The report seems to have little substantial information about the environmental impacts of the projects being funded (including generation part of the transmission projects to be funded). It seems to assume that small projects will necessarily be environmental friendly, which is not the case if we look at the example of Bhilangana small hydropower project in Uttaranchal, where an agitation is ongoing against the project.

Moreover, ADB assumes that if it funds the transmission component of the big hydro projects, it is not responsible for the impacts caused by the generation components of such projects. This is clever attempt to wash its hands off the responsibility for the impacts of such projects, but is clearly not acceptable. Since transmission component is integral part of such big hydro projects, any agency funding such essential component has to be held responsible for the social and environmental impacts of the full project.

The claims on environmental issues can be dismissed out of hand as they lack basic details about the role of communities in planning and decision making, norms for muck reuse and disposal, norms for downstream releases, cumulative impact assessments and systems to ensure compliance of the plans.

Land Acquisition The expansion of transmission systems will require 8.03 ha of permanent land acquisition and 179.21 ha of temporary acquisition from private owners. Of 179 ha temporarily acquired, owners will be compensated for lost agricultural income for an estimated 115 ha of agricultural land. In addition, 16.03 ha of public land will also be acquired, not clear for what component.

- SHEPs will require 3.12 ha of permanent acquisition from private owners and 10.87 ha of public land.
- Land acquisition and resettlement from core subprojects will affect 25 households on a permanent basis and 229 on a temporary basis. None of the components will involve any loss of structures.

Environmental Impacts Para 73 of the report says, "The SHEPs use trench weirs instead of dams, a design feature that ensures the maintenance of minimum river flow. The rivers are non-navigable, no commercial or subsistence fisheries are located in the investment program area, and rural and village water use will not be affected. The principal impacts are clearance of vegetation, management of excavation soil and rock, and reduction in water flow in short sections of small rivers. These impacts will be mitigated by appropriate erosion control measures, re-use of excavation wastes wherever possible, controlled disposal of residual excavation wastes, and provision of compensation for reforestation at a ratio of 2 ha of forest land for each ha taken by the subprojects. No endangered, rare, or threatened species of flora or fauna have been reported at any subproject sites. Adequate provisions have been made for the environmental mitigation and monitoring requirements and their associated costs. The Investment Program will have a small "footprint": the maximum amount of land directly affected by all subproject components is less than 12 sq km out of a total program area larger than 51,000 sq km. The subproject sites are located mostly on land owned by GOU. The land acquired for new substations is mostly uninhabited and unused land located outside towns and villages. Mitigation measures related to construction and specified in the EMP will be incorporated into civil works contracts. Implementation of mitigation during construction will be primarily a responsibility of the contractors, but the implementing agencies will be responsible for overall implementation of site-specific EMPs."

Many claims have been made in the above quoted para, with no substantiation. Such claims can be very

inadequate and misguiding as can be seen from a few issues listed below.

- It is not clear how the muck created by the construction activity will be reused or disposed.
- It is not mentioned as to what is the norm for release of water downstream from the diversions.
- It is not clear if a cumulative impact assessment at river basins and tributary basis has been even attempted to see the total social and environmental impacts of vearious projects and comparison of the same with the carrying capacity of the area.
- It is not clear what has been and will be role of the local communities in planning, decision making and implementation of the projects.

The claims of the project of earning carbon credits and income there from are unlikely to materialize as such projects are supposed to follow the guidelines of the World Commission on Dams to earn carbon credits. There is absolutely nothing in this case to show that the project indeed follow WCD guidelines. It does not even attempt to show that the projects are part of the least cost options, for example.

The claim in para 74 that "Local air quality, particularly indoor air quality, will improve because of the substitution of electricity for biomass (animal dung and wood) and kerosene." is wrong as electricity does not replace cooking fuels. Nor is there any guarantee that local people will all get electricity for lighting and other uses.

Conclusion It is clear from above analysis that the proposed ADB project for Uttaranchal Power Sector is founded in very weak appraisal, is based on assumptions that exaggerate the demand projections and project benefits. It is very weak in social & environmental components and the claims of public consultations have been unconvincing. The project is likely to be economically unviable and financially risky. Its claim of carbon credit benefits are unlikely to be realized. The project tries to escape responsibility for the social and environmental impacts of the large hydro projects whose transmission component it plans to fund. ADB would also stand responsible for the violations that have already occurred in such projects and for the economic and hydrological non viability that would result in future.

Table 6
UTTARANCHAL
Power generation from each project during 2002-03 to 2005-06

Project (MW)	2002-03		2003-04		2004-05		2005-06	
	Gen-MU	MU/MW	Gen-MU	MU/MW	Gen-MU	MU/MW	Gen-MU	MU/MW
Ramganga (198)	180	0.909	199	1.005	212.00	1.071	333.30	1.683
Khatima (41.4)	162	3.913	173	4.179	182.98	4.419	165.04	3.986
Pathri (20.4)	101	4.950	97	4.755	103.20	5.059	98.49	4.428
Chibro (240)	873	6.638	814	3.392	636.07	2.650	804.96	3.354
Khodri (120)	409	3.408	388	3.233	301.37	2.511	378.83	3.157
Chilla (144)	562	3.903	688	4.777	745.78	5.179	659.18	4.578
Maneri Bhali (90)	457	5.077	488	5.422	457.74	5.086	455.21	5.058
Dhakrani (33.9)	175 (33.8)	5.178	160 (33.8)	4.734	126.29 (33.8)	3.736	164.65	4.857
Dhalipur (51)	259	5.078	231	4.529	186.04	3.648	236.13	4.630
Khulal ((30)	165	5.5	154	5.133	129.07	4.302	160.92	5.364
M Pur (9.3)	37	3.978	0	0	30.59	3.289	36.40	3.914
Sobla (6)	0	0	0	0	0	0	0	0
NHPC projects								
Tanakpur (120)	427	3.558	512	4.267	496.69	4.139	483.17	0.026
Dhauli Ganga (280)	0	0	0	0	0	0	314.45	1.123
Total (1384)	**3807 (1103.9)**	**3.449**	**3904 (1103.9)**	**3.566**	**3607.82 (1103.9)**	**3.268**	**4290.73**	**3.1**
Plant Load Factor	**39.37 %**		**40.71%**		**37.31 %**		**35.39 %**	

Source: Central Electricity Authority, www.cea.nic.in

Table 7

Schedule of proposed generation component of Uttaranchal Project

($ million)

Project	**Project / Owner / Capacity** (MW)	**Total Cost**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Alaknanda Group	Tapovan Vishnugad / NTPC / 520 MW	624		93.6	187.2	249.6	93.6		
1 New HPPs	Lata-Tapovan / NTPC / 108 MW	129.6			19.44	38.88	51.84	19.44	
	Bhinderganga / UJVNL / 15 MW	18			2.7	5.4	7.2	2.7	
	Pulana/ UJVNL / 13 MW	15.6				2.34	4.68	6.24	2.34
	Srinagar / Tata / 330 MW	396		59.4	118.8	158.4	59.4		
Alaknanda Group	Bawlanandprayag / UJVNL / 132 MW	158.4		18.75	37.5	50	18.75		
2 New HPPs	Vishnugad-Pipalkoti / THDC / 420 MW	504				75.60	151.20	201.60	75.60
	Madhyamaheshwar / UJVNL / 10 MW	7.87	1.18	2.36	3.15	1.18			
	Kaliganga I / UJVNL / 4 MW	3.35	0.5	1.01	1.34	0.5			
	Kaliganga II / UJVNL / 6 MW	5.11	0.77	1.54	2.05	0.77			
	Tankul / UJVNL / 7.8 MW	8		1.2	2.4	3.2	1.2		
	Malkhet SHPP Cluster / UJVNL / 68 MW	81.6				12.24	24.48	32.64	12.24
Bagirathi Group 1	Loharinag Pala / NTPC / 600 MW	720		108	216	288	108		
New HEPs	Pala Maneri / UJVNL / 416 MW	499.2	74.88	149.76	199.68	74.88			
	Maneri I RMU / UJVNL / (144 MW)	15	2.25	4.5	6	2.25			
	Bilangana II / UJVNL / 49 MW	58.8		7.5	15	20	7.5		
	Kaldigad / UJVNL / 9 MW	6.5	0.97	1.77	2.6	0.97			
Bagirathi Grp 2	Kotlibhel I, II, III / NHPC / 940 MW	1128	56.4	112.8	225.6	225.6	225.6	169.2	112.8
New HEPs	Mohammadpur RMU / UJVNL / (9.3 MW)	5.48	0.82	1.65	2.2	0.82			
	Pathri RMU / UJVNL / (20.4 MW)	11.78	1.77	3.53	4.71	1.77			
Yamuna Tons Grp	Arakot Tuni / UJVNL / 70 MW	84				12.60	25.20	33.60	12.60
1 New HEPs	Hanoi Tunu / UJVNL / 45 MW	54				8.10	16.20	21.60	8.10
	Tuni Palasu / UJVNL / 42 MW	50.4				7.56	15.12	20.16	7.56
Yamuna Tons Gr 2	Hanuman Chatti / UJVNL / 33 MW	39.6				5.94	11.88	15.84	5.94
New HEPs	Mori Cluster (7 Plants) / UJVNL / 163 MW	195.6				29.34	58.88	78.24	29.34
Other RMU projects	Total program for 9 HEPs / UJVNL / 200 MW	150	5	15	35	60	20	10	5
TOTAL	**Generation Coponent**	**4969.89**	**144.54**	**582.37**	**1081.37**	**1335.94**	**900.73**	**611.26**	**271.52**

Source: Appendix 2, ADB project report

Table 8

DETAILED COST ESTIMATE BY EXPENDITURE CATEGORY (ADB COMPONENT)

($ million)

		Total Cost	**Base Cost (%)**
A. Investment Costs			
Clean Energy Development			
Component A: New Small Hydropower Plants[a]			
1. Kaldigad (9MW, Kaldigad River, Uttarkashi District)		9.62	2.81
2. Kaliganga-I (4MW, Kaliganga River, Rudraprayag District)		4.40	1.28
3. Kaliganga-II (6MW, Kaliganga River, Rudraprayag District)		6.83	1.99
4. Madhyamaheswar (10MW, Kaliganga River, Rudraprayag District)		13.00	3.79
		35.00	**10.20**
Component B: Renovation, Modernization, and Upgrade			
1. Pathri (20.4MW, commissioned in 1955)		12.90	3.76
2. Mohammadpur (9.3MW, commissioned in 1951)		6.10	1.78
		19.00	**5.54**
Component C: Hydrological Improvement		**7.80**	**2.27**
Component D: Environment Management Plan		**0.20**	**0.06**
	Subtotal	**62.00**	**18.07**
Taxes and Duties		7.00	2.04
Base Costs excluding Taxes and Duties		55.00	16.03
Transmission Expansion		**274.00**	**79.88**
Capacity Building		**7.00**	**2.04**
Total Base Cost		**343.00**	**100.00**
B. Contingencies			
1. Physical[d]		30.00	8.75
2. Price[e]		25.00	7.29
Subtotal (B)		**55.00**	**16.04**
C. Financial Charges During Implementation[f]			
1. Interest During Construction (not financed by ADB loan funds)		39.00	11.37
Total Project Cost Including Candidate Projects		**437.00**	**127.41**

a These costs include land acquisition and resettlement compensation costs of $0.19 million in local currency.

d Physical contingencies include 10% provision on base costs.

e International cost escalation factors and domestic escalation factors for 2005-2009 are used to estimate price contingencies. Foreign inflation of 2% and domestic inflation of 4.8% are applied for years beyond 2009.

f ADB loans will finance up to 70% of total project costs, exclusive of interest during construction.

POWER OPTIONS

Maharashtra

- **MERC approach paper on Renewables** The Maharashtra Electricity Regulatory Commission has prepared an approach paper for making it obligatory for distribution companies to buy a certain minimum % of electricity from renewable sources at certain fixed rates. The proposal is to fix 3 % for 2006-07, to increase to 6% by 2009-10. The suggested tariff is Rs 3.5 per unit for wind, Rs 2.84 for small hydro and Rs 3.04 for biomass for 2006-07, to increase marginally to 2011-12. The proposal is to have a penalty of Rs 7 per unit for failure to comply with obligations. Maharashtra currently has 1002.96 MW installed capacity under renewable sources, including 703 MW from wind, 206.33 MW from small hydro, 73.5 MW from cogeneration, 14 MW from biomass and 6.13 MW from industrial waste.
- **Tillari SHP** Maharashtra proposes to set up a 10 MW small hydro project at Tillari on Goa-Maharashtra border. Goa has sought 7.5 MW share from it as Goa has contributed 75% cost of the project.
- **CFLs** The Maharashtra govt has decided to replace electric bulbs with compact fluorescent lamps in all govt buildings. (Financial Express 150506)

ILFS to manage Maharashtra Renewable energy fund Infrastructure Leasing & Financial Services will manage the Maharashtra govt's Rs 418 crore seed fund for non-conventional energy, called *Urja Ankur Nidhi*. Govt of Maharashtra will contribute Rs 218 crores and rest will come from ILFS. Under the fund, the govt would give 100% finance for NCES projects – 20% in the form of equity and the rest as debt. (Power Line 0406)

TN wind power industry unhappy with tariffs The Tamil Nadu wind power industry is unhappy with the tariff order given by the TN Electricity Regulatory Commission on May 15, 2006. The order says that wind power units selling power would get Rs 2.75 pr unit, up from Rs 2.7 per unit earlier. The industry had suggested a tariff of Rs 3.32 during the public hearing. The General Manager of Enercon India, a wind turbine manufacturer says a price of Rs 3.1 would have helped getting more investments. The wheeling charges have been retained at 5%. The tariff for power from biomass and cogeneration units have been fixed at Rs 3.15 per unit. However, during non crushing season, the tariff for power from cogeneration unit is Rs 3.01 per unit. (Business Line 170506)

Punjab seeks World Bank loan The Punjab Energy Development Agency has sought a Rs 700 crore soft loan from the World Bank for setting up 16 renewable energy power projects including biomass and micro hydel projects. The state-govt agency had sent the request to Centre, which in turn has been forwarded to World Bank for approval. PEDA is planning to harness the entire hydro power potential of 136 MW in the state by 2010. Work has already started on setting up a 25 MW of HEP. It is in the process of allotting 50 MW of HEPs to private parties. To generate power from agricultural waste, PEDA has identified 35 sites for setting up 1 000 MW of biomass power plants. It has allocated power projects of 66 MW to private developers while projects of 90 MW more capacity will be allocated to private parties. (PTI 300406)

Global Wind Energy Scene Global wind capacity has grown at a compound Annual Growh rate of 24 % in the last fout years – from 24 927 MW in 2001 to 59681 MW in 2005. The capacity is projected to grow to 117 412 in next four years.

Global wind energy installed capacity

Year	Installed Capacity MW
2001	24 927
2002	32 037
2003	40 301
2004	47 912
2005	59 681

Countries with high wind installed capacity

Country	Installed Capacity MW
Germany	18 428
Spain	10 027
USA	9 149
India	4 430
Denmark	3 122

The year 2005 saw very high growth, with additional installation of 11 769 MW, 43.4% increase over 2004, up from 8207 MW added the previous year. US reported the highest annual addition of capacity at 2431 MW, India added 1430 MW by Dec 2005. The capacity in India is likely to go upto 8 000 MW by 2009. China is expected to take rapid strides after its renewable energy law became effective in January 2006.

The high prices of conventional fuels and availability of carbon credits under the Kyoto protocol are big reasons for this. (Power Line April 2006)

Gains from Efficiency: California way Since 2001, California has bounced back, fashioning a new framework of utility regulations that places greater emphasis on efficiency than ever before. Through 2008, utility companies plan to spend $2 billion - a record for any state - to help Californians save energy. The investment will yield a net gain of $3 billion in economic benefits for the state by reducing utility bills. "This efficiency campaign will avoid the need to build three large power plants," says Brian Prusnek, a senior staff member at the California Public Utilities Commission. "In terms of greenhouse gas emissions, that's the equivalent of taking 650,000 cars off the road. How many other investments yield a 50 % financial return and reduce pollution?" (www.nrdc.org 030406)

Publications available with SANDRP

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2. *Power Finance: Financial Institutions in India's Hydropower Sector,* P Bosshard, SANDRP, '02, p 132, Rs 100/
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4. Citizens' Guide to the World Commission on Dams, By A Imhof, S Wong & P Bosshard, IRN, pp 59, Rs 30/-.
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11. ECOLOGIST ASIA SPECIAL ISSUE ON DAMS IN NORTH EAST INDIA, Jan-Mar 2003, pp. 96, Rs 50/-.
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19. *Know Your Power:* A Citizen's Primer on the Electricity Sector, Prayas, Pune, 2004, p 138, Rs 150/-
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26. *Unravelling Bhakra*, Shripad Dharmadhikary, Manthan, 2005, pp 372, Rs 150/- (individuals); Rs 300 (institutions)
27. *Large Dams for Hydropower in NorthEast India* SANDRP & Kalpavriksh, June '05, p 228, Rs 150 (individuals), Rs 300 (institutions)

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