ADB's loan for Uttaranchal Power Sector

Disguised attempt to fund large hydro projects

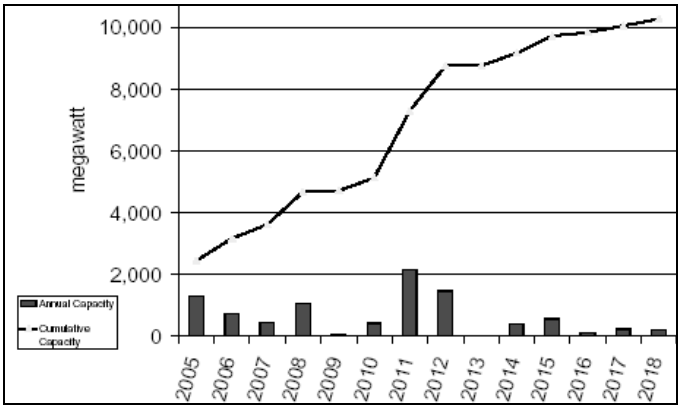
The Asian Development Bank has approved a $ 300 million loan for Uttaranchal Power Sector, that includes $ 45 m component for small hydro projects. However, major component is to fund transmission lines for a number of proposed large hydro projects that have already seen violations of Indian legal norms 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.)

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.

"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"

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

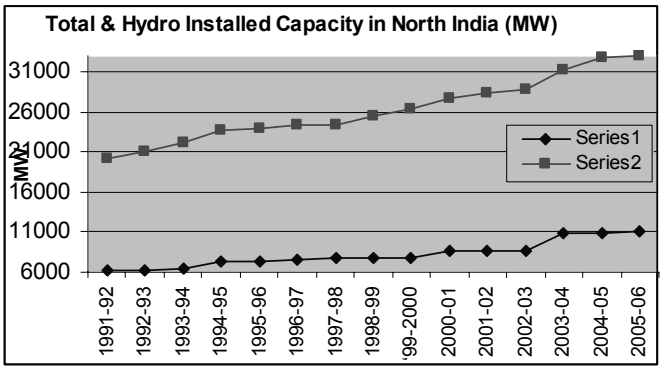
CAGR: Compound Annual Growth Rate, this is for the period 1994-95 to 2003-04.
Source: Official website of the Northern Region load dispatch centre www.nrldc.org, annual reports of various years

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 constructio