

Hydro-electric power plant projects in northeastern India

The northeastern region of India including Assam and Arunachal Pradesh is blessed with abundant natural resources. The Government of India (GOI) is planning to use valuable resources of the region to enhance the standard of living of the people of the region. The northeast has a hydro-power potential of 32,000 MW which constitutes about 38% of India's total hydro-power potential of about 84,000 MW. GOI has planned five hydro-electric power plants on Siang (Dihang) and Subansiri rivers in northeastern India to generate 17,300 MW of electric power. The Sumatra and Andaman earthquakes of 26 December 2004 have left no room not to speculate a major earthquake in Assam region where the last major earthquake¹ (M 8.5–8.7) occurred about 55 years ago. Judging by the plans, programmes, policies and bureaucratic attitudes related to the development of the resources, especially the water resources, one can discern a disturbing paradigm that is not at all

favourable to the region in the long run in view of the seismic vulnerability of the region. Although the GOI is making efforts to monitor crustal movements and monitor seismicity of the area, the risk sustains. Secondly, with the development of this potential as being planned, the region will have to accept submergence of large areas of natural beauty with inescapable destruction of flora and fauna.

The proposed power plants may be placed in such a seismically vulnerable region only if we consider proper seismic attenuation relations and such relations invariably do not exist due to lack of seismic instrumentation in the region. The proposed dams for the hydro-electric power plants will store huge amounts of water. In the event of any major earthquake disaster, if proper seismic design is not followed, the disaster of dams will result in havoc similar to what was recently faced by the people due to a tsunami! Technocrats who are involved with the proposed dam projects

are relying on the available mathematical modelling techniques based on incomplete assumptions using 'DAMBRK' software by National Weather Service, USA, for analytical predictions with apparent acceptability that underplays and masks the phenomenal intrinsic risk. Such crude assumptions do not convince one that it is safe to build dams in such a highly seismic region.

1. Bilham, R., Gaur, V. K. and Molnar, P., *Science*, 2001, **293**, 1442–1444.

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Enhancing quality of research

Sharma¹ has stated (line 7 from top) 'A recent ranking of world universities and institutes is given at <http://ed.sjtu.edu.cn/ranking.htm>. There is no mention of Indian universities in the top 500'. This statement is not true.

I could find three places at which Indian universities are mentioned: (i) world rank 215 in the range 202–301: Indian Institute of Science, Bangalore; (ii) world rank 421 in the range 404–502: Indian Institute of Technology, Kharagpur; (iii) world rank 461 in the range 404–502: University of Calcutta, Kolkata. I am happy to find that we have at least 3 places in the world class universities. The survey covers 200 universities of USA, 209 universities of Europe, 89 universities of Asia Pacific region and 4 universities from Africa. Out of the 89 of Asia Pacific region we have won 3 only. The performance criteria

chosen were such that these three have got into the statistics.

I am sure that our other IITs at Chennai, Mumbai, Kanpur and Delhi would be in this list if research alone is considered and for that matter BITS, Pilani and other NITs also would be in the select list. The quality of research is improving and we note that funding has increased considerably for the fields of medical sciences, life sciences, physics, chemistry and material science.

1. Om Sharma, P., *Curr. Sci.*, 2004, **87**, 1641.

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Response

The point raised is technically correct. I regret the error.

I wanted to say that 'it is difficult to find a mention of our universities'. Somehow the error crept in during one of the revisions. A couple of other institutes like CCMB, NII and some universities enjoy high international reputation. My pointer was specifically to the bulk mediocrity and urgent need for the corrective measures if we are to 'catch-up'. I am happy to find that the note has catalysed discussion.

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