

**International Conference on Hydropower for Sustainable Development
During Feb 05 – 07, 2015 at Dehradun**

Recommendations

Preamble

1. The issue of development versus environmental protection should be seen with reference to current scenarios when life has moved from industrial to post industrial age. The general consensus of national and international experts/participants in the conference is for speedy development of hydropower for long term energy security, water security, financial security and sustainable development.

Policy/Administration/Legal

2. State is to decide whether it wants or not to develop its abundantly available natural renewable resource of hydropower. For harnessing the hydropower the policy should not only remain on paper but should also see actions on ground. The recently proposed draft hydro power policy be declared and all related actions by different departments be taken in time bound manner and all approvals /clearances be online.
3. Ownership of the projects should be clearly understood and appreciated. State owns the water and also owns the hydropower projects in terms of state royalty. Accordingly the hurdles being faced in the matter of ownership need to be resolved with the spirit of cooperation. To create a favourable atmosphere for hydro-power development in the state by making people aware that through private sector investment, it would be possible to kick-start economic activities and investment in hydro-power sector as one major sector, so the investor is to made to feel that he is welcome.
4. The state field machinery in the areas of hydropower projects must be oriented and given specific role to facilitate the time bound development of hydropower. Officials especially in the field e.g. Commissioners, District Magistrates, Sub Divisional Magistrates need to be sensitized that like other private industrial investors, investor in hydro power sector is also a major investor and their problems must also receive their close attention; for this the Energy Department and other related departments must hold awareness programmes for these field officials so that the problems raised by private power investors including problems created by some local individuals are attended on priority by these officials.
5. Other efforts at grievance redressal of private investors must also be attended to through periodical meetings with such investors and their associations at various levels, including at the field level (district and sub-division). Far more frequent consultations should be held at the state level with the Association of Hydro-power investors to facilitate their investments and ease the problems that they face in implementation and post -production stages.
6. State government must defend adequately all hydropower related legal cases of stakeholders against those who create obstructions for hydropower development as per state hydropower policy
7. Simplification of approval as per state draft policy for SHP above 2 MW is well taken and shall go a long way to bring SHP sector back to development process in the state.

8. Natural perennial available water resources, steep gradient of rivers and good regulatory mechanism are conducive to hydropower development in the hilly states like Uttarakhand, Himachal Pradesh, J&K and Arunachal Pradesh for which following specific areas require immediate strengthening
 - i. Land transfer – after identification of the land and the cost deposited by the developers through state nodal agency
 - ii. Adequate infrastructure for access and power evacuation.
9. Forest Rights Act 2006 (FRA 2006) requires a immediate review and amendment particularly for the forest area. Except tribal areas, all other areas should not need the consent of the locals for the land use. Areas where rights have been already settled should not be covered under the FRA act.
10. For transmission line, the mandatory 15 m wide corridor should be reviewed as such width is required for specific higher line voltage and cannot be generalized for voltages up to 132 kV.
11. Failure of Renewable Energy Certificates (REC) mechanism has been a setback to hydropower development and MOP/ MOEFCC /CERC should be asked come out with new effective mechanism.
12. The flood devastated projects should not be treated as NPA till the full restoration is achieved and for this RBI/FIs be advised.
13. In view of the fact that storage schemes of hydro power are the largest energy storage facility available worldwide, the building up of reservoirs for balancing of much talked renewable energy like solar and wind and their multi-purpose use for water as well as energy security is important.
14. Recently adopted policy for paying the right price of land for the project, third party insurance to the project affected people both directly & indirectly should lead to better result. Post commissioning environmental studies should be carried out invariably and placed online for wider public acceptance and review.
15. Decision making needs to be expedited as delay in decision causes heavy price in terms of cost and delayed benefits.
16. Fluctuating rate of electricity is a matter of concern for hydropower development and should be stabilized with reasonability.
17. Basin level planning and coordination in the basin is the key for successful development of hydropower. The cascades of hydropower projects are sometimes owned by different developers, coordination in design and operation of plants in cascade is essential. To maximize efficiency and to deal adequately with environmental impacts, it is time to restart a basin level planning process with objectives modified to reflect issues considered important by the society today.
18. Appropriate institutional mechanism be developed to coordinate and implement basin-wise and sector-wide actions to facilitate optimum and effective development of hydropower by specifying roles of expert institutions or centers of excellence to undertake the sector level detailed investigation programs and other research studies to address uncertainties.
19. Framework be specified for cost-sharing among all current and prospective project developers for the costs of the planned studies, planning processes, monitoring, and

even for operation coordination (for example for sediment management, peaking generation).

20. Benefit-sharing mechanisms be developed for sharing of benefits at the river basin level and over the life of the project to ensure a stake of the communities in the project over long term rather than a one-time compensation.
21. Land intrusion, human-animal conflict, distance between two projects, length of river that can be affected by tunnel or dam, and concept of ecological flow are important issues and require ecological and environmental surveys and investigations,
22. Environmental flow should be put in law rather than in agreements or contracts which ask for recommendation of making “environment” a concurrent subject.
23. Effective & successful promotion of HP requires ascertaining it as a RE source and follow the environmental regulation for sustainable development.

Perception

24. Perception about hydropower as contributing to disaster is removed as no study has brought out any fact or figure to support such misperception. State government should bring out the facts on regular basis through official documents and interaction with media.
25. Informed decision-making through improving baseline information availability and reliability needed.

Employment

26. All *panchayats* having the water potential for micro hydro be encouraged to install micro hydropower projects for their local use and raising its financial resources by connecting to the grid.
27. For creating adequate proper awareness, disseminating the need and usefulness of Hydropower projects and collecting data, a scheme as *Urja mitra* may be launched which shall not only provide useful employment to the educated and trained manpower available in the areas of hydropower projects but shall also act as ambassador and promoter for hydropower and other energy development in the region.
28. In the era of IT, placing the trained manpower for working at remotely located project sites is a challenge and has to be addressed by providing urban equivalent infrastructure facilities.
29. Local community participation is important for successful implementation of a HP project. Local community through local ITI, colleges and Polytechnics can accumulate and build up an organization of themselves for development of a HP project. Financial back-up by FIs like NABARD, etc and technical back-up by reputed institutes with proper training and placements should be provided to them and make them active stakeholders of the project.

Sustainability

30. Sufferers should necessarily be part of the development process from its conceptualization, planning, implementation and operation and share the benefits and responsibilities, as in hydro power policy announced and adapted by Govt. of India and state of Himachal Pradesh.

31. Recently developed “Hydropower Sustainability Assessment Protocol”, a methodological framework to assess the sustainability of a particular hydropower project at all the stages of its development be adopted as practice. To facilitate awareness and participation of local communities, ownership of the protocol shall be with the governmental nodal agencies or associated NGOs rather than the project developer. This would lead to a better delivery and facilitate decision making at the key stages of project development.
32. Country requires energy security and Indian hydropower industry is passing through difficult time in view of the prevailing perception. It is the right time to take measures keeping in view the prevailing environment in the sector.
33. Quantity or amount of e-flow to be left out would primarily depend on how much and to what extent ecological benefits are needed from the project. An optimum trade-off between the development of the hp and ecological imbalance reductions need to be worked upon. Regulations of e-flows can be decided on the basis of size of the projects; range of e-flow for medium and large sized projects with a simpler mechanism for small projects is appreciable.

Implementation

34. Challenges to take up construction in Uttarakhand and Arunachal Pradesh. Construction agencies in the country are facing financial challenges. Almost all of them have gone for CDR.
35. Underground construction is always a challenge and is critical. Technology up gradation in terms of deployment of equipment. Future for the country is going underground.
36. Disaster management plans for hydropower projects is mandatory these days. However such plans be made according to project size and their likely impacts.
37. Tunneling is safe subject as sufficient discharge can flow through it without encroaching upon the land, forest and terrestrial life. Hydro tunneling requires that the standard threshold values of the significant parameters of tunneling process for designing must be known. Stage-by-stage Tunneling process should follow in a pre defined direction and regular and timely monitoring of the tunneling process should be followed and the cost to the contractor be timely paid.
38. Geotechnical baseline report and risk management plan should go hand in hand and assessment of continuous risks and vulnerabilities be followed. Technologies are available to support poorest of poor rock conditions but one has to have patience to deal with rocks and follow the rules of tunneling and boring. For extra work performed, associative payments should be evaluated. Cash flow to the contractors should be maintained and regularly monitored. Processes of blasting pattern, shotcreting, mucking and providing timely support through adequate machinery should be initiated at right time.
39. In view of the high silt erosion of the hydraulic structure and hydro turbines in the Himalayan region, a depository of silt data and online monitoring of silt flow for all the rivers, power channels, penstocks, experience gained by different power utilities and manufacturers, facilities and technology required and available be established by a national independent institution.

40. Integrated Basin wide Catchment area Management is required to protect and conserve biodiversity and contribute to sustainable development, for reducing sediment contribution towards hydro projects, the hydro catchments need to be developed on basin wide CAT Plans.
41. Climate is changing and the design practices should be changed in order to account for such climate changes (Design changes to accommodate variability of climate that will happen in the coming years).
42. All the key players in development and operation a HP project should come together for working up of feasible solutions, rather than going for legal actions that delay the overall development of the community.
43. Pre and post economic studies connected with R&R of hp development project is the need of hour.
44. Specific scientific study of the impact on the biological life of river streams during development of a HP project, especially fishe movement on fauna needs to be developed.
45. Protection of river banks after the extreme floods is the need of hour and be taken up in general as the banks are not for hydro power but for a normal life of state.