

Strategic environmental assessment*

Hydropower plays an important role in the socio-economic and overall development of any country. Majority of the Himalayan States such as Himachal Pradesh (HP), Uttarakhand, Jammu & Kashmir, and Arunachal Pradesh have an estimated potential to generate 20,415, 20,000, 25,000 and 50,328 MW respectively, of the total hydroelectric potential of 117,139 MW in the Indian Himalayan Region (IHR). With a purpose to tap this available hydropower potential, various rivers and streams have been dammed to harness hydroelectricity. For example, River Sutlej is the largest river system of HP with the total catchment area of 20,398 sq. km spreading over the districts of Lahaul & Spiti, Kinnaur, Solan and Bilaspur. Currently, there are 37 hydroelectric projects of different categories which are constructed in the region, while a several small and large projects are either proposed or under construction stages. Similarly, the Alaknanda basin has 38 hydropower projects with a catchment area of about 12,587 sq. km. Due to haphazard and unscientific constructions, these projects in either of the basin are adversely affecting the fragile ecosystem of the concerned regions. In India, hydropower development policy is usually single project-oriented and cumulative impact assessment (CIA) of such projects has not been properly adopted in a river basin. As a result, the number of projects from ecological boundary perspectives is overlapping in the whole IHR. Environmental impact assessment (EIA) has been under practice for getting clearance for a single project. However, hydropower projects are not being introduced in a relative term keeping in mind the carrying capacity of a whole watershed or whole basin. Without implementing and following such an

approach, a series of projects are coming up day by day in a whole river watershed or basin. Therefore, strategic environmental assessment (SEA) could be an effective approach to address the risks of unplanned development after involving local stakeholders (such as local communities, local government, environmentalists, NGOs, scientific institutions, etc.) in the hydropower development process.

In this context, a training workshop was held to familiarize people about SEA and its working mechanism. SEA approach would enable the authorities and the Government to analyse the positive and negative impacts of the projects and would help in mitigating measures for not only ongoing projects, but also for future planned projects. In total, 40 stakeholders, including Government officers, project developers, project-affected people, local people, environmental experts, consultants, media, NGOs, research scholars and scientists participated and discussed the environmental problems and their sustainable management focusing mainly on the Satluj basin.

In the technical sessions, M. R. Bhardwaj (Deputy Commissioner, Kinnaur) said that scientific development is a need of the hour to sustain biodiversity and environmental issues related to activities of development of hydroelectric projects. He said that all the issues at various levels need to be considered in a proper scientific manner. Anjal Chauhan (District Forest Officer, Kinnaur) spoke on implementation of catchment area treatment (CAT) plan during hydropower development and the reforestation done through Forest Department at different locations under these CAT plans. J. C. Kuniyal (GBPIHED, Himachal Unit, Mohal-Kullu, HP) discussed the overall status of hydroelectric projects which are being introduced in series without knowing the carrying capacity of the basin. Assessment of carrying capacity of the Sutluj basin prior to introducing the projects will go a long way in improving the conditions of the existing environment development and economic status of the natives. A stretch of 922 sq. km is covered under hydroelectric projects (HEPs)

in which Remote Sensing and Geographic Information System (RS&GIS) analysis shows 179 sq. km (6.07%) of the total influence zone area as overlapping. This may be unsustainable from the ecological viewpoint in future for the projects themselves as well the region. So there is a need to follow the SEA approach for hydropower development throughout the IHR. A definite ratio between the major, micro and small projects in a basin at the same time would again be ecologically sound. Such ideas need to be incorporated in our hydropower project policy at country-level. Results of the current ongoing SEA study in the Satluj basin were also discussed. Sarla Shashni (GBPIHED) spoke about the socio-economic assessment of hydropower projects. The major elements which attracted attention in dam construction were mainly population displacement, downstream social impacts, boomtown formation and loss of cultural heritage. These issues were discussed along with the recommendations such as framing guidelines and policies with well-compensated resettlement, involving and training local communities in construction work and assessment of the downstream areas to lower the negative impact. Amit Kumar (GBPIHED) highlighted the salient features of a draft manual – ‘SEA of hydropower projects: a hand manual’, which is being prepared in Hindi and English by the Institute. This manual, according to him, would be helpful in improving the awareness of the local communities, project authorities and the local governments in framing the relevant policies in future.

The participants present in the workshop agreed upon the hydropower development. However, it was also realized that hydropower development needs a relook to build them in a sustainable manner so that the negative impacts of the projects could be minimized and positive impacts could be maximized.

R. S. Negi (retired IAS) suggested that areas above 2500 m in the Satluj basin should be declared as ‘eco-sensitive zone’ under Environment Protection Act 1986 and construction of hydroelectric projects beyond that altitude should be

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completely banned. No objection certificate from village panchayats (Gram Sabhas) under Tribal Law (i.e. HP transfer of land use Regulation Act 1968, PESA Act 1996 and FRA 2006), incorporation of the issues raised during public hearings, studies on the permissible pollution limit and their impacts on agricultural/horticultural crops, management of solid waste, 30% release of water from dams in all the seasons, and exchange of land during calamity were some of the major issues raised by him. He also proposed sharing of 25% of the total economic benefits instead of only 2% free energy supply according to the present norms, for the affected communities as a compensation for environmental loss. He also raised the issues of non-compliance of Government policies and orders such as Local Area Development Fund (LADF), royalty, Rehabilitation and Resettlement (R&R) plan, compensation from damage, etc. by the project developers and proposed the provision of special law to take legal action against defaulters.

During the open discussion session, stakeholders suggested that the Himalayan region is fragile and sensitive and due to blasting during tunnelling, it causes many social and environmental impacts such as drying up of natural springs, increasing frequency of landslide occurrences and formation of cracks in the houses and human settlements, etc. They suggested the use of hi-tech tunnel boring machines (TBMs) rather than blasting. The river morphology is destroyed by the construction activities of the projects. The excavation material and muck dumping on the riverbeds and/or on the river banks have caused siltation problem. These activities may enhance the disasters during heavy rainfall in the basins. The best examples may be seen from the recent past disasters such as the Kedar Valley in the Uttarakhand (16–17 June 2013), Kinnaur district (HP; 17–18 June 2013), and flash flood in Jammu and

Kashmir (10 September 2014). These have also affected fish breeding. Fishing and agriculture have been age-old practices in the Sutluj basin. Fish ladders/fish elevators need to be provided in the dam sites. Channel management is poor near the construction sites of hydroelectric projects. It was also discussed that transmission lines are affecting the orchards, agriculture land and wild life. Thus transmission lines should be away from the agricultural land and human habitation, since these are affecting, directly or indirectly, their communication system. The loss of agricultural crops, apple orchards and forests due to transmission lines needs to be controlled. R&R process should be done at the initial stage of developmental activities. Many people believe that they were not fully compensated in lieu of their losses by the project authorities. The policies need to be region-specific in respect to fragile mountainous topography. Execution of all activities needs to be carried out strictly in accordance with the detailed project report (DPR). All local people were unanimous that the recommendations given by them during the time of public hearings were not followed properly or implemented during execution. The construction waste is not properly managed and disposed, which is responsible for serious environmental degradation. The stakeholders believe that the promises made by developers either at the time of public hearings or reported in Environmental Management Plan (EMP) in favour of people or environmental protection measures could be hardly fulfilled. So there is a need of re-assessment of physical and social environment after the commissioning of hydropower projects. This would be helpful to re-evaluate the environmental consequences in the project-affected areas. Kinnaur and similar regions of the Himalaya have a great potential for future tourism and such damages during construction of

HEPs will destroy the tourism potential in the IHR. All the projects should be proposed only in the less populated areas. All participants agreed that large HEPs require geographically more area and are more prone to adverse impacts in their surrounding environment. Small HEPs are eco-friendly rather than large HEPs. Thus, to avoid or minimize adverse impacts, small HEPs should be encouraged in the river basins of the Himalayan region. Majority of the large HEPs are overlapping the ecological and physical boundary of another projects. Such projects need to be considered only after assessing carrying capacity of the river in a particular region. Otherwise, it will invite lot of geological, physical (water, air, soil, etc.), biological, economic, social and cultural problems in the host regions. Social infrastructure (school, road, primary health centre, temple, community hall and bridges) has been developed by the project authorities, but people are not satisfied because these developments are confined to the immediate peripheries of the project areas.

Finally, all participants agreed to minimize the negative impacts in the surrounding environment, which requires coordinated efforts on the part of different stakeholders. If issues are resolved in a cohesive manner, the stakeholders including natives agreed to work together for the protection of the environment and sustainable development in the region.

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