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A study on environmental protection act 1986 with a special reference to construction of dams across Ganga River

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Abstract
The Ganges begins at the confluence of the Bhagirathi and Alaknanda rivers at Devprayag. The Bhagirathi is considered to be the true source in Hindu culture and mythology, although the Alaknanda is longer. The headwaters of the Alakananda are formed by snowmelt from such peaks as Nanda Devi, Trisul, and Kamet. The Bhagirathi rises at the foot of Gangotri Glacier, at Gaumukh, at an elevation of 3,892 m (12,769 ft).Although many small streams comprise the headwaters of the Ganges, the six longest and their five confluences are considered sacred. The six headstreams are the Alaknanda, Dhauliganga, Nandakini, Pindar, Mandakini, and Bhagirathi rivers. The five confluences, known as the Panch Prayag, are all along the Alaknanda. They are, in downstream order: Vishnuprayag, where the Dhauliganga joins the Alaknanda; Nandprayag, where the Nandakini joins; Karnaprayag, where the Pindar joins; Rudraprayag, where the Mandakini joins; and, finally, Devprayag, where the Bhagirathi joins the Alaknanda to form the Ganges River proper.

Keywords: environmental protection, construction, dams across

Introduction

A major barrage at Farakka was opened on 21 April 1975, It is located close to the point where the main flow of the river enters Bangladesh, and the tributary Hooghly (also known as Bhagirathi) continues in West Bengal past Kolkata. This barrage, which feeds the Hooghly branch of the river by a 26-mile (42 km) long feeder canal, and its water flow management has been a long-lingering source of dispute with Bangladesh.

Indo-Bangladesh Ganges Water Treaty signed in December 1996 addressed some of the water sharing issues between India and Bangladesh. Tehri Dam was constructed on Bhagirathi River, tributary of the Ganges. Its located 1.5 km downstream of Ganesh Prayag, the place where Bhilangana meets Bhagirathi. Bhagirathi is called Ganges after Devprayag. Construction of the dam in an earthquake prone area was controversial.

Bansagar Dam was built on the Son River, a tributary of the Ganges, for both irrigation and hydroelectric power generation. Dams are critical infrastructures built with massive investments with diverse projected uses, like power generation, irrigation, flood control, drainage, drinking water supply etc.

India is the third largest dam builder in the world with more than 5100 large dams built to date. Some of the oldest dams in the world exist in India. Demands for decommissioning have been already raised for the Mullaperiyar dam (117 years old), Dumbur dam over the Gumti river in Tripura and Jaikawadi Dam in Maharashtra in different contexts.

Estimates reveal that around 100 large dams are more than 100 years old and more than 400 large dams between 50 – 100 years old. The collapse of the 118 year old Jaswant Sagar dam in Luni river basin in Jodhpur district of Rajasthan a few years back stands before us as a living example of the massive scale of downstream destruction caused by dam break. The failure of the Machuu dam (28 m high masonry work) in Gujarat back in 1979 had resulted in the death of more than 2000 people. In Fact the Standing Committee under the Chairman, Central Water Commission (CWC) constituted by the Government of India in 1982 had recommended unified dam safety procedures for all dams in India and the necessary legislation on dam safety.

However, dam safety issues under the Dam Safety Bill 2010 mainly deals with the proper surveillance, inspection, operation and maintenance of dams with respect to certain parameters to ensure their safe functioning and thereby to protect the persons and property against risks associated with dam failure. The equally if not more serious performance related and environmental surveillance related aspects are yet to be considered seriously within the environmental governance framework.

Rivers are foremost ecological entities and their hydrological potential is inextricably linked to the ecological wellbeing of the flowing river and its catchment. We are facing the reality of rivers unable to perform their ecological functions, failing to reach the seas during summer and collapse of inland fisheries across the country, with direct pointers towards dam induced environmental problems (explained later). A study by the International Water Management Institute (IWMI) shows that Krishna and Kaveri have reached full or partial closure.

Another IWMI study shows that in the Krishna river basin, the storage capacity of major and medium reservoirs has reached total water yield, with virtually no water reaching the sea in low rainfall years. The scenario is so serious that governments cannot afford to ignore the need for putting in place strategies for assessing the actual performance and environmental impacts of the thousands of dams already operating in the country and have measures for repairing damaged ecosystems and river dependent livelihoods.

It is here that the Ministry of Environment and Forests (MoEF) has a pivotal role to perform in deciding upon the viable

options including dam decommissioning for the long term ecological survival of rivers In the case of large dams built with huge construction costs, environmental uncertainties represent considerable financial risks for the dam-builders and governments. The profitability from such dams depends upon how long they continue to provide the services they have been built for after completion at the cost of the massive environmental damage wrought by them.

Objectives of the act

- To co-ordinate the activities of the various regulatory agencies already in existence.
- Creation of an authority or authorities with adequate powers for environmental protection.
- Regulation of discharge of environmental pollutants and handling of hazardous substance.
- Speedy response in the event of accidents threatening environmental and deterrents punishment to those who endanger human environment, safety and health.

Performance assessment scenario of dams across the river 'ganga'

The performance assessment scenario of dams across the river "Ganga" is plagued by many such serious problems;

1. Environmental clearance once granted to a hydroelectric / irrigation project is in perpetuity. There is no mechanism for periodic assessment of the performance of the dam or the project including dam safety aspects, siltation studies, *post facto* impact assessment on downstream ecology, fisheries and related livelihoods and seismicity. A mechanism for assessing and including the cost of dam decommissioning and ecological reparation when the construction costs of the dam are assessed and placed before the various committees for clearance is yet to materialize.
2. India is yet to have clearly defined, legally binding accountability mechanisms in case of dam failures. Civil society groups and movements working for protecting rivers have been consistently pointing out the need for the same.
3. Studies reveal an alarming increase in the rate of siltation of reservoirs in India leading to heavy loss to the public exchequer. Impacts of siltation of reservoirs include increased evaporation losses, increased backwater flooding and also could damage the power house turbines. The Report of the Government of India's National Commission of Integrated Water Resources Development implies that we are losing about 1.3 BCM of storage capacity each year. Even this can be an underestimate. In fact, the power generation from the upgraded 15 MW installed capacity at the Gumti Dam in Tripura is so low that even the World Bank strategy paper for the North East (dated June 28, 2006) recommended exploration of decommissioning of the dam. As per 2006 estimates we have already lost a quarter of the live storage capacities of 23 reservoirs due to siltation. SANDRP estimates reveal that on an average, each day we are losing Rs. 40 million worth of storage capacity through siltation. Meanwhile there is a lack of proper official estimate of the cost of loss of reservoir storage capacity for all the operating reservoirs in the country.
4. There is no legally enforceable mechanism by which environmental flows should be allowed below already dammed rivers. Hence most dammed rivers have either curtailed and regulated flows or diverted flows in the downstream. As for completely diverted rivers as in the case of Mulla periyar where the ecological death of the river is evidently visible to the layman"s eye, even minimum flows have not been allowed into the river for the last 117 years.
5. As per the Dam Safety Bill proposed in August 2010, "dam failure" shall mean such failures in the structures or operation of a dam which may lead to uncontrolled release of impounded water resulting in downstream flooding affecting the life and property of the people. The Bill does not contain any norms relating dam safety with environmental impacts.

   While dam safety remains the domain of MoWR it does not touch upon the environmental impacts, both upstream and downstream, in case of faulty performances, lack of proper sediment flush outs, sudden flooding of downstream due to uncontrolled releases of impounded water, dam failure etc. In other words, MoEF which grants environmental and forest clearance to dam projects does not have a role when it comes to dam safety related issues impinging upon the river ecology or livelihoods dependent upon rivers.
6. Even for those dams where the safety alarm has been sounded, there is a lack of proper assessment of potential impacts on ecology and downstream livelihoods. In 1979, leaks were detected in Mullaperiyar, one of the oldest dams in service in the world located within the Periyar Tiger Reserve in the Western Ghats. The Central Water Commission (CWC) appointed a Committee to look into the matter. The CWC ordered lowering of the height of the reservoir level to 136 ft from 152 ft including leak proofing as precautionary measure against possible dam failure.

   Many more leaks have been detected in the structure and the people living downstream are constantly under fear of dam failure. There is not much happening on the ground related to precautionary measures related to dam failure from the government. To date there has been no attempt by the MoEF to commission an appraisal of the type or extent of impacts of dam failure on the people's lives or ecology downstream.
7. In the cost benefit analysis (CBA) associated with dams, socio - economic costs of loss of riparian forests and islands, flood plain habitats, fish habitats and fisheries, aquatic ecosystems etc. have been either unaccounted or under rated or just dismissed as externalities to make the dam project look benign. Such an analysis can reveal the reparation costs associated with future decommissioning.
8. Majority of irrigation and hydropower dams do not have proper fish passages. The few fish passes built in India are on the Mahanadi barrage, Nartaj barrage in river Mahanadi, the Hathnikund barrage on river Jamuna and Farraka barrage on Ganga. Most of these structures have drawbacks. Presently fish passages are recommended in environmental clearances. Experiences in the US which is the reveal that inspite of fish ladders or structural improvement, fisheries have declined.

9. Like a river which is ever changing and dynamic in nature, changes can also occur in the catchments over time. Human interventions like mining, infrastructure development, deforestation, soil eroding agriculture take place within the dam catchment over years which can lead to silt build up in reservoirs leading to reduction of capacity and performance of the project. There is no mechanism for accounting such changes into the performance analysis

Dam decommissioning is nothing radical or new – in fact in the US dams have been designed to be decommissioned at the end of their useful lives. In the US, most dams are licensed by the Federal Energy Regulatory Commission (FERC) or its state equivalent, usually on a 30-50 year cycle. At the end of that license cycle they have to be reevaluated and can then be retired. There are also emergency procedures for de-licensing dams in the event of safety concerns such as earthquake damage, etc.

Through the relicensing process, FERC has mandated new operating conditions to meet environmental concerns, including increased minimum flows, added or improved fish ladders, periodic high flows, and protection measures for riparian land. Dam decommissioning offers a range of alternatives from full removal of the structure to partial removal to changes in management. In cases in which full or partial dam removal is not considered a viable option, there are opportunities to change dam operation and to implement new water use planning without significantly limiting or abolishing the social and economic benefits of the dam and/or hydroelectric power plant operation. There could be many reasons for decommissioning a dam. These concerns need to be weighed properly based on relevant assessments before taking a decision whether to decommission a dam or not.

Issues for constructing dams across the river 'ganga'

The important reasons usually considered across the world include:

1. Economic reasons including inefficient power production or irrigation efficiency, high operation and maintenance costs, obsolescence etc.
2. Dam safety and Security issues – related to faulty design or wearing out of materials used for construction
3. Silt build up – eventually all reservoirs will get filled up
4. Legal and financial liability
5. Ecosystem restoration – for restoration of fisheries, riparian habitats, flood plains and other riverine ecosystems
6. Site restoration – heritage value or for the sake of the habitat

Importance of environment protection act, 1986

In this Act, unless the context otherwise requires,--

(a) "environment" includes water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property;
(b) "environmental pollutant" means any solid, liquid or gaseous substance present in such concentration as may be, or tend to be, injurious to environment;
(c) "environmental pollution" means the presence in the environment of any environmental pollutant;
(d) "handling", in relation to any substance, means the manufacture, processing, treatment, package, storage, transportation, use, collection, destruction, conversion, offering for sale, transfer or the like of such substance;
(e) "hazardous substance" means any substance or preparation which, by reason of its chemical or physico-chemical properties or handling, is liable to cause harm to human beings, other living creatures, plant, micro-organism, property or the environment;
(f) "occupier", in relation to any factory or premises, means a person who has, control over the affairs of the factory or the premises and includes in relation to any substance, the person in possession of the substance;
(g) "Prescribed" means prescribed by rules made under this Act.

Rules to regulate environmental pollution

(1) The Central Government may, by notification in the Official Gazette, make rules in respect of all or any of the matters referred to in section 3.
(2) In particular, and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely:--
(3) the standards of quality of air, water or soil for various areas and purposes;
(4) the maximum allowable limits of concentration of various environmental pollutants (including noise) for different areas;
(5) the procedures and safeguards for the handling of hazardous substances;
(6) the prohibition and restrictions on the handling of hazardous substances in different areas;
(7) the prohibition and restriction on the location of industries and the carrying on process and operations in different areas;
(8) the procedures and safeguards for the prevention of accidents which may cause environmental pollution and for providing for remedial measures for such accidents

Penalty for contravention of the provisions of the act

(1) Whoever fails to comply with or contravenes any of the provisions of this Act, or the rules made or orders or directions issued there under, shall, in respect of each such failure or contravention, be punishable with imprisonment for a term which may extend to five years with fine which may extend to one lakh rupees, or with both, and in case the failure or contravention continues, with additional fine which may extend to five thousand rupees for every day during which such failure or contravention continues after the conviction for the first such failure or contravention.
(2) If the failure or contravention referred to in sub-section (1) continues beyond a period of one year after the date of conviction, the offender shall be punishable with imprisonment for a term which may extend to seven years.

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