POLLUTION IN INDIAN RIVERS AND CONFLICTING ASPECTS OF ITS MANAGEMENT

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Abstract:

Water recently has become an interest for various groups inside and outside academia, policy framework, state and mass media, and even the judiciary is not apart as cases of water disputes, water right and water pollution are on increase in India and across the globe. Even though freshwater resources are limited, the current scenario is toward their decline. In India, 14 Major River basins are identified which cover about 87 percent of the total drained area of the country. The rivers which remained sacred for ages have been reduced to mere sewage drains and garbage dumps in India. In this background, this paper focuses on the current dismal state of affairs of Indian rivers, existing legal and institutional mechanisms for addressing the situation, and required future practices for checking pollution therein.

Keywords: *water right, pollution, conflicts, management*

Introduction:

The analysis of global water resources suggests that less than one percent of water is available for human consumption and more than 1.2 billion people still have no access to safe drinking water (Datta, 2005; Hassan, 2004). Affordable, abundant, and safe water is essential for humans and all life forms on the earth. There are clear linkages between access to potable water, mental and physical health, nutrition levels, labour productivity, economic growth, and quality of life. Water for centuries has been considered a flow resource cyclically renewed through the hydrological cycle. River valleys are considered to be the cradle of ancient civilizations as they flourished near water bodies. River water has not only been used for drinking, irrigation, industrial, and as a means of cheap transportation but also for performing rituals. With each technical advancement, respect for nature declined in all parts of the world, with India no exception. As waterways used to be the primary means of transportation, most industries got located along riverbanks and coastal areas after the industrial revolution. Increased industrialization and consequent urbanization changed the consumption patterns of people and generated huge quantities of waste. This waste easily found its way to rivers which were treated as freely available dumping sites. Consequently, river water got polluted and a larger proportion became unsuitable for human consumption apart from endangering aquatic life. Although water bodies especially rivers dilute chemical discharge from industries with their continuous flow but a regular addition of waste renders them incapable of doing so. Environmental deterioration occurs when humans deplete resources and create waste at rates exceeding the environment's capacity to regenerate, assimilate and recover (Abesuriya *et al.*, 2008). The local water pollution problem existed

even several hundred years ago in almost all countries in the form of isolated patches in a healthy environment, but now the patches have grown to form continuous pollution areas leading to the environmental deterioration of the entire ecosystem (Dybern, 1974).

Maintaining water quality improves its availability and unhygienic conditions reduce it. Many studies (Dybern, 1974; Egboka *et al.*, 1989; Rao, 2001; Rosen, 2007) have tried to work on the quality of rivers and groundwater. A study of the river Ganga, considered to be one of the most sacred rivers by Hindus, along a 645 km stretch between Rishikesh and Kanpur during 1993-95 was done for knowing its biological wealth (Rao, 2001). Some similar studies on river water pollution are by Trivedi *et al.* (1990) on the river Krishna in Maharashtra and by Dybern (1974) and Mohapatra *et al.* (1995) evaluated the hazardous content of insecticides in water. These contents contribute to non-point source pollution as their chemical components go through subterranean water to streams and finally to the sea.

River Water Pollution in India

India possesses about four percent of the total annual runoff of World Rivers. The per capita availability of runoff was about 2500 cu. meter per year (in 1987) which continued to decrease with an increase in population (CPCB, 2002). The annual average rainfall in India is about 4000 km^3 per year, of which surface flow is estimated as 1880 km^3 per year (*ibid*). There is spatial variation in the amount of rainfall and hence surface flow as well as available groundwater potential. Rivers are the main sources of surface water in India which has 14 major and several medium river basins. During lean periods, these rivers and tributaries flow as sewage *nalas* (narrow water channels) as sufficient water is not available for diluting the pollutants. A decrease in runoff may be both due to natural (seasonal pattern of rainfall in the country) and anthropogenic causes (construction of dams). Pollution can be associated with development as 80 to 90 percent of water pollution problems in most industrialized and developing countries have come up since 1950 (Dybern, 1974). There are various sources from where pollutants are added to water bodies such as sediments, pesticides, fertilizers, pharmaceuticals, chemical and industrial processes, mining, household sewage, untreated urban water, air pollutants, carbon oxides, heat, oil spills, and gas leakage. Indian rivers and water bodies are polluted mainly by insecticides, rainwater runoff from agricultural systems, disposal of outdated stocks, containers, and packets, discharge of wastewater from industries (Mohapatra *et al.,* 1995). Pollution of surface water especially rivers are fatal because they are the primary source of drinking water. A large number of towns and cities located along the rivers in India have not given thought to the problem of untreated sewage, which continues to flow into the rivers. Initially, pollution was considered geographically restricted caused mainly by the direct discharge of untreated water from towns and industries (Dybern, 1974), but later on it was noted that pollutants are added to the streams and rivers as sub-surface flow far away from the source of use and they are found even in the oceans away from the mouth of rivers. These are known as point source and non-point source pollution. Point source pollution is easy to monitor and regulate and

even in countries like India, several legal provisions have been made to control it by industries and municipalities but non-point source pollution is a serious concern as it is difficult to monitor and control.

It is noted that organic pollution measured through biochemical oxygen demand (BOD) is considerably high and water bodies are highly eutrophicated (nutrient pollution) near large urban centers in India (CPCB, 2008). This is primarily because of untreated or semi-treated discharge added to the rivers. A low DO (dissolved oxygen) level is generally associated with a high BOD level. In many rivers DO level goes as down as 0 mg/l like Hindon (0.0 mg/l), Yamuna (0.0 mg/l), Sabarmati (0.0 mg/l), only a few rivers have a DO level above 4 mg/l (the prescribed limit) like Narmada, Brahmaputra, Mahanadi, Brahmini, Baitarni, Beas, and Subernrekha (*ibid*). Sharma (1996) noted that in Delhi about 2000 million liters of wastewater go to the Yamuna every day. The situation becomes worse in summer due to less volume of water in the river. The contribution of Delhi to river pollution can be judged by the fact that DO level and BOD level vary tremendously at Wazirabad (where the Yamuna enters Delhi) and Okhla, where it becomes virtually a dead river. Similar conditions have been witnessed in all major rivers like Ganga at Kanpur or Varanasi.

Control of River Water Pollution in India

Although there were several smaller treaties between countries to check water pollution, the Stockholm conference in 1972 was a manifestation of the concerns of the international community over growing air and water pollution levels around the world. Pollution Control Boards were constituted all over the world to control the discharge of liquid effluents from the outlets of factories or cities into water bodies rendering it unsafe for all forms of life. The pollution control of water in India began with the establishment of institutions like central and state pollution control boards and pollution control committees. These committees started monitoring the quality of surface and groundwater at different places, to suggest preventive measures. Pollution control activities can only be effective when data about the quantum of pollution in rivers is made available. Central Pollution Control Board (CPCB) is the nodal agency for the collection and dissemination of pollution data in the country. CPCB in a combination of State Pollution Control Boards and the Central Water Commission (CWC) develops techniques for monitoring the pollution levels of water at different places. There were 405 monitoring stations on 15 major rivers in 1996 and it has gone up to 695 in 2008 spreading across 27 states and 6 union territories (CPCB, 2008).[1] The CPCB monitors water samples at different locations and analyses 9 core parameters (PH, temperature, conductivity, dissolved oxygen (DO), biochemical oxygen demand (BOD),

[1] The state of Rajasthan does not have any monitoring station as there is no perennial river in the state; only 27 states are noted and the three newly created states Uttarakhand, Chattishgarh, and Jharkhand are taken along the respective states of UP, MP, and Bihar. These Fifteen rivers are other than the major fourteen river basins that have been noted earlier, these are monitored continuously by CPCB for the pollution levels (Ganga, Yamuna, Sutlej, Brahmputra, Mahanadi, Narmada, Tapi, Godavari, Mahi, Krishna, Cauvery, Baitarni, Brahmini, Sabarmati, Swarnrekha).

nitrate, nitrite, fecal coliform, and total coliform) and another 19 general parameters along with monitoring of 9 trace metals and 15 pesticides.[2]

Union Government's Ministry of Environment developed an action plan for the prevention of pollution of the river Ganga and a national river conservation plan. Ganga Action Plan was launched in 1985 amidst great fanfare to clean the river. The action plan was based on a comprehensive survey of the river basin and it was noted that about 80 percent of pollution in the river was due to raw sewage discharge. The first phase of the action plan was to construct infrastructure for sewage treatment. The second phase of the action plan (1992) incorporated the cleaning of the river and its tributaries like the Yamuna. However, the result can be judged by the fact that the BOD level in the Yamuna is still as high as 93 mg/l (the BOD standard is less than 2 for A quality[3] water that is suitable for drinking).

Legal and Institutional Mechanisms

Indian legal system addresses the concern and issues regarding water pollution based on various legislations. While fundamentals of the legal framework are based on Water Act 1974, four important sources, in general, can be identified that address the question of water pollution: (1) a comprehensive scheme of administrative regulation through the permit system of water known as 'Prevention and Control of Pollution Act' of 1974; (2) provision of the 'Environmental Protection Act of 1986' relating to water quality; (3) public nuisance actions against a polluter, including municipalities charged with violating the norms; and (4) the common law right of riparian owners to unpolluted water (Divan and Rosencranz, 2004). The Water Act of 1974 is one of India's first attempts to deal comprehensively with pollution issues that have large environmental impacts. Indian parliament adopted an amendment to this Act in 1978 and revised it in 1988 to make it in compliance with the provisions of the Environment Act of 1986. Indian constitution defines water as a state subject[4], and the water act was enacted under Article 252(1) of the constitution empowers the union government to legislate in a field that is of state. All states of India have approved the implementation of the Water Act which is comprehensive in coverage including streams, inland, subterranean, and sea or tidal water. The act enables the state to prescribe standards for the discharge of effluents. As the central act remained silent on the standard of discharge that goes to rivers and streams, most state pollution boards showed a lackluster approach to formulating the standard and that is why in 1988

[2] General parameters include the concentration of sodium, sulfate, magnesium, potassium, etc, and the trace metals include lead, cadmium, copper, arsenic etc, for details see, Status of Water Quality in India – 2007, CPCB, 2008, p. 13

[3] CPCB has identified various types of water use and classified water based on use into 5 categories and also has specified permissible levels of pollutants in each category of water, for details see, Status of Water Quality in India – 2007, CPCB, 2008, p. 17.

[4] The Indian federal structure of polity allows states to formulate laws and regulate the subjects that are defined under the state list (i.e. seventh schedule) and the union government does not interfere in that. For details on union list, state list, and concurrent list, see, (Basu, 2005).

revised act incorporated it based on the Environment Act of 1986. This Act gives the central government similar authority to establish and prescribe water quality and effluent standards throughout the country. The Act puts a check on water pollution and prohibits the disposal of effluents to streams, wells, and sewers or on land above the prescribed standards. It also empowers the state boards to check the level of pollution, issue notices to polluters, and recover expenses for such work from the polluter. The CBCP helps state boards by providing them with the existing level of pollution at different points in streams but after that, it is the responsibility of state boards to serve the notice and make recovery if there is some violation. The state board also plans comprehensive programs for the prevention and control of water pollution in the state. The 1988 amendment of the Act allows citizens to have a relevant report about pollution-related activity unless the state board determines that the disclosers would harm the public interest. This new addition was needed, as water is a public good and the common citizen has the right to its safe access. Difficulties in monitoring and implementation of schemes arise as CPCB is a central monitoring body meant for prescribing guidelines but it has to depend on state pollution control boards and the respective state governments for any punitive action.

The regulatory body in India along with the legal framework (CPCB, 2008; Environmental Act, 1986) has echoed their concern for people's participation in the management of water especially waste discharge to open water bodies. As water is a public good so making it available to all without deterioration in quality becomes mandatory and ethical for the management. However, results are normally neutralized either due to bureaucratic inertia or due to corporate manipulation of the norms. Though new industries are supposed to give information and publish in all media along with public notice boards about the outcomes of their establishment in an area, the amount of pollution generation, and preventive mechanisms for public response and criticisms, they often get the benefit of being unaware, ignorant and least concerned people.

The sustainability of water resources normally is taken in terms of economic value but social and environmental factors do not get much importance though the treatment of polluted water (which may be paid by the polluter on the polluter pay principle) later costs heavily for the economy. This kind of argument gets a theoretical foundation from environmental phenomenologists, who argue that today is more important and advocate the management of crisis as of day forgetting the past. It is argued that this kind of cost recovery in a neo-classical economy is insufficient to protect the environment especially water and ecological economic principle is needed so that excess use is constrained and small size and less cost technological alternatives like stormwater retention for aquifer recharge, and rainwater harvesting are used by more people. It is important to note that water resource management especially checking on pollution in rivers and streams can be done only by incorporating ethics of equity, community participation, and social management integrating local, regional, and global elements. This can be done by

establishing priorities of stakeholders at various levels i.e., the local users, the community, the state, and the actual and prospective polluters.

An integrated approach to water management is the major focus of all management bodies including the Indian legal and monitoring system, but still managing water resources suffer the most due to greater fragmentation all over the world (Hassan, 2004). Every government or private body is concerned about its interest and there are lots of coordination problems at different levels. Hydro-electric projects do not care for downstream water availability, urban authorities do not bother about irrigation water, farmers are ignorant of the outcome of unwise practices of cultivation, especially tilling and use of pesticides at the wrong time and season, donor agencies are more concerned of sustainability of municipal bodies and water supplier, rather than water resources and so on. It is the need of the hour to evolve an integrated water management system that deals with local problems of water availability, its distribution and consumption at household, agricultural and industrial levels, discharge of waste and sewage at the local, trans-regional and national context and other measures to check pollution. Here peoples' participation is very important as knowing the consequences they will not allow water to be polluted that belongs to them as their right.

Conclusion

Water and the preservation of its quality are crucial for vast biological existence but any of the frameworks whether legal or ethical has not stressed its intrinsic value as most of them are based on utilitarian approaches and anthropocentric explanations. It is very important to educate people about the intrinsic value of water and its present and future importance as a resource so that they become aware of the current scenario and at the same time about their rights under the Public Trust Doctrine and responsibilities towards its protection. The need of the hour is to integrate different approaches and impart these to larger masses so that their rights are not misappropriated by the State or corporate by different means (excess extraction, construction of dams, bottling industries, pricing, pollution, etc.). Here morality and ethics are needed not only in theory but for creating aware mass and informed citizens through environmental education. We have no right to use the earth and its resources in a way that puts other life forms in danger and forces distant people to bear the consequences of the problems created somewhere else. One's responsibility is the other's right. If we agree to this statement, probably, there will be fewer water issues and more efforts for better management and conservation.

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