

THE GANGA ACTION PLAN: WATER RESOURCE MANAGEMENT AND SUSTAINABILITY

Dr. Bhabani Shankar Panigrahi
Principal
Rahul College of Education , Mumbai , India

Abstract : River Ganges in India has been the locus of sacred rites for the Hindus. The religious significance of the Ganges is physically manifested in ghats, that form the land-water interface. Besides serving as a site for religious bathing and cremation, the ghats are also tied to people's livelihoods and are an inseparable part of their daily lives. Increasingly urbanization around Ganges basin sustains more than 40 percent of India's population, at the same time, industrialization and the pressures of a growing population along its banks have contributed to alarming levels of pollution in the river. In 1985, the Government of India launched the Ganga Action Plan with the primary objective of cleaning the river. However, characterized by centralized planning and control with little public participation, the Plan had limited impact. In 2011, the government launched yet another clean-up program, the National Ganga River Basin Project with support from the World Bank. This paper focused the tenuous relationship between the need for 'efficient' management of environmental problems and public participation and sustainability.

Keywords: *Ganga Action Plan, Ganges River, pollution control, participation, urbanization, sustainability, management .*

1. Introduction

The river Ganges has been the cradle of civilization in the Indo-Gangetic plains of northern India for several thousand years. Today, it sustains 43 percent of India's population. The Ganges basin is among the most heavily populated areas in the world with an average density of 520 persons per square kilometer. Not only is the river a vital resource for agriculture and industry, it also holds an iconic status in India's cultural heritage. However, post-independence, the relentless push to modernize was accompanied by massive expansion of industry, urbanization and pressures of population growth. In the process, this invaluable resource was reduced to a convenient means of waste disposal. Municipal sewage is a major culprit followed by industrial effluents and agricultural run-off. The river is also a site for religious bathing, washing and watering of animals, and the disposal of human and animal corpses. To tackle the escalating problem of pollution, the Government of India (GoI) has launched ambitious programs such as the Ganga Action Plan (GAP).

2. Theoretical Framework

Various efforts to clean the Ganges have, so far, fallen far short of their stated goals. A critical analysis of the factors responsible for the shortcomings of the GAP underscores the fact that any large-scale pollution abatement program conceived at the macro-level requires not just collaboration with local institutions but also capacity building and public participation to adequately deal with diffuse sources of pollution. It cannot simply be imposed from the top. The theoretical framework presented in this section highlights the institutional aspects of the recent shift from 'government' to 'governance'. Focusing on decentralization and participatory water governance, this framework helps to analyze the GAP and the management of the Ganges river basin.

Environmental resource management is well supported by "decentralization from below" since it is physically tied to a local context and has a history of everyday management and use. However, it is important for grassroots constituents to exert pressure, since local governments often prioritize resource exploitation for economic development. Integrating the management of larger hydro-ecological systems with decentralization can be challenging. It requires the setting up of federations of local governments at a regional level. Civil society representatives play a crucial role in ensuring that such regional committees are downwardly accountable. Collaboration between civil society and local governments makes decentralization more effective. At the same time, it is important to keep civil society in check through representative authorities.

3. A Sacred River Dsecrated

The Ganges river system originated near the Gangotri glacier in the Himalayas and flows 2525 km from its headwaters to the Bay of Bengal is one of the largest in the world. It originates. It accounts for 25 percent of India's water resources. In recent years, the increasing demand for agricultural production and the growing urban centers in the basin have been exerting immense pressure on this resource. A large proportion of Ganges water is diverted into the Upper and Lower Ganges canals to support agriculture, reducing flows in the main river. Although various tributaries replenish the river to a certain extent as it flows downstream, the reduced flows, particularly during the lean months (January–May), have diminished water quality as pollutants become concentrated, impairing ecological communities and exceeding bathing standards. This is apparent in cities

like Varanasi where pollution levels are often found to be higher during these months. This imminent threat will compound the serious problems with which urban populations and institutions in the Ganges basin are already struggling.

Varanasi, also known as Kashi (the city of light) to the Hindus, sits on the western bank of the Ganges. It is one of the seven sacred cities or *tirthas* (crossings or fords) where Hindus can find *moksha* (spiritual liberation). The city's waterfront is lined with *ghats*, which are symbolically associated with the passage from life to death or life hereafter. Devout worshippers gather at the *ghats* every morning to take a holy dip in the hope of attaining *moksha*. The city is reputed to be a seat of spiritual education. Sages and pilgrims have come here to teach and to study the Vedas (a collection of Hindu religious texts). Unlike many other cities in India, Varanasi has retained much of its old character. Even today, the *ghats* bustle with activity. Multitudes of Hindus from across India come here on a spiritual odyssey—to bathe in the river and drink its holy water. It is also the last resting-place for the dead, whose cremated ashes are immersed in the river for spiritual rebirth. The area between the tributaries, Varuna and Assi (from which the city's name is derived), mark the sacred limits where *moksha* is guaranteed to those who die or are cremated there. The Hindus also believe in the purifying qualities of the Ganges, carrying away jars filled with its water, which is used for religious rituals. Livelihoods thrive along the *ghats* as *pandas* (brahmin priests who officiate religious rituals), *ghatias* (brahmins who oversee ghat rituals), and *pujaris* (brahmin priests in charge of worship in the temples) offer their services to pilgrims and vendors sell everything from flowers and oil lamps to Coca Cola for thirsty travelers. *Dhobis* (washermen) use the waterfront to wash clothes while the *yadavs* (milkmen) bring their water buffaloes to bathe in the river.

At the same time, the pressures of urbanization have begun to take a toll on the city and its holy river. Over the years, city master plans have fallen by the wayside due to changing politics and lack of implementation resources. Sewage systems, built during the colonial era, are grossly inadequate in meeting the demands of a growing city. Much of the city's sewage and industrial waste flows untreated into the river, alongside religious bathing. According to the Central Pollution Control Board (CPCB) of India, the main sources of pollution are urban sewage, industrial liquid waste, large scale bathing of cattle, throwing of dead bodies in the river, and surface run-off from solid waste landfills and dumpsites. The Swatcha Ganga Research Laboratory in Varanasi, which conducts regular water quality tests, found that fecal coliform counts (FCC) range between 16,000 to 60,000 mpn per 100 mL of water from the bathing *ghats*, which far exceeds the permissible limit (limit for bathing is 500 mpn per 100 mL as stipulated by the CPCB). Similarly, biological oxygen demand (BOD) values are much higher (4.4 to 7.6 mg/L) than the water quality standard of less than 3 mg/L for bathing, particularly between Kannauj and Varanasi. Tanneries, chemical plants, textile mills, distilleries and slaughterhouses discharge untreated liquid waste into the river through open drains and canals. Water users are exposed to this pollution and face a high risk of waterborne diseases.

The great paradox is that the sense of “river” in India is so intricately interwoven with belief systems and symbolism that it becomes difficult to disentangle sacred and secular concerns. We conducted a brief survey along the Ganges waterfront in Varanasi to assess people's relationship with the river. Our sample included pilgrims, priests, and residents ($n= 50$). Participants were asked about their perception of pollution in the Ganges and about the GAP-I. Maps and newspaper clippings were an important source of information. The researcher also used photo-documentation to record spatial pattern and cultural activities along the *ghats*. Our data revealed that those who depend on the Ganges for spiritual sustenance speak of “pollution” in terms of sacred impurity associated with declining social and religious values. They refer to the Ganges as “mother” and “purifier”, establishing strong cultural ties with the river. They invoke the Ganges' purifying power through the practice of *snan*—religious ablutions, meditation, and worship. Some respondents did acknowledge the problems associated with pollution due to an expanding city. However, they did not undermine the cleansing powers of *Gangaji*.

The residents of Varanasi and the pilgrims who travel to this holy city from far-flung places are hardly dissuaded by the fact that coliform bacteria levels in the river are dangerously high. Their spiritual bond with the river remains strong even today and their faith in the healing properties of the Ganges continues to bring them to the *ghats*. In January 2001, an estimated 7.5 million people bathed in the Ganges at the *Maha Kumbh Mela*, a religious congregation that occurs every 12 years. The festival was held in Allahabad at the confluence of the Ganges, Yamuna, and Saraswati rivers known as the *sangam*, which is associated with very high religious merit. At the same time, changes in water quantity and quality in the Ganges basin have witnessed mounting tension among stakeholders trying to protect their interests.

4. Pollution Control Programs for the Ganges

The Ganga Action Plan (GAP) can be linked to public outrage regarding pollution. In 1985, environmental lawyer M.C. Mehta filed a PIL in the Supreme Court of India holding the government and industries responsible for the alarming rise in pollution in the Ganges. The Ganga Pollution Cases ultimately resulted in pollution fines and the closure of several industries that were found guilty of not complying with environmental legislation. That same year, the Central Ganga Authority (CGA) was created within the Department of Environment. The CGA developed the GAP, a massive program designed to control pollution in the Ganges and its tributaries. The objective was to establish a series of sewage treatment plants near the main urban centers, renovate all existing sewage pumping and treatment stations, provide wastewater sub-pumping stations at the mouths of open drains not yet linked to existing sewer systems, expand existing sewer networks by connecting unserved areas, and construct electric crematoriums to address the issue of improperly cremated human remains along the *ghats*.

5. Gaps in the GAP

India has had the necessary environmental legislation for the protection of water resources since enacting the Water Act of 1974. However, enforcement has been chronically deficient. Water resources in urbanized basins globally are under stress, and the Ganges is a most prominent exemplar. Clean up programs have had little success in checking pollution. For instance, according to the report published by the Comptroller and Auditor General of India, by the year 2000, the GAP had achieved only 39 percent of its proposed target for sewage treatment, consuming 91 percent of its budget allocation. The report also shed light on the discrepancies in the selection of cities and towns, allocation of funds based on inaccurate estimates of sewage load, and wide variation in the performance of different states in meeting GAP targets.

6. Moving Forward: What Needs to Be Done Differently?

The Prime Minister of India declared the Ganges a National River and set up the National Ganga River Basin Project (NGRBP) for its clean up in November 2008. A \$1 billion loan from the World Bank was approved in 2011. Recognizing the past failure of clean-up projects of which the GAP was the most prominent, the NGRBP emphasizes the need for effective water resources management. The NGRBP will be the first basin-level initiative in India to manage an inter-state river for water quality and environmental protection. According to the World Bank, “successful river clean up requires supporting urban services.” The project goals, therefore, confront the challenges of urban governance and highlight the role of the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) in strengthening the capacity of urban local bodies for infrastructure improvements.

Water Quality and Environmental Protection

Effective pollution control programs in the Ganges basin lies in clearly differentiating between point and non-point source pollution and their removal. While checking point sources such as municipal sewage calls for major institutional reform along with the use of context-appropriate treatment technology, tackling the seemingly intractable non-point sources could benefit from a participatory approach involving all stakeholders. River basin management and urban water quality programs aimed at non-point sources, many of which are tied to the religious significance of the river, should focus on building partnerships and sustainable relationships, at the core of which should be representative and collaborative state, civil society, and the private sector. The GAP never remotely achieved this ideal. However, the NGRBP, which takes into account the shortcomings of the GAP, could provide an opportunity to work collectively to resolve the non-point source pollution while respecting those aspects of people’s relationship with the river that are profound and sacred.

Urbanization, primarily through unplanned in-migration of rural poor looking for employment, has also seen the proliferation of slum settlements lacking access to basic services. The effectiveness of sewage treatment plants is often compromised when untreated wastewater from households that are not connected to the sewage infrastructure flows into open drains and find its way into the river. Addressing this vast and spatially dispersed, yet locally idiosyncratic, problem will put much of the onus on local governments.

Public Participation

The GAP largely ignored public participation despite having funds allocated for it. It is interesting to note, therefore, that the NGRBP has made provisions for public participation although it has not yet outlined how it is to be implemented. Large-scale environmental problems, like that occurring in the Ganges basin, stem from a vast and complex array of point and non-point source pollution. Unlike point source pollution, the root causes of the non-point source pollution are mostly socio-political, economic and religious and cannot be handled exclusively by experts. Although policy makers have dominated environmental decision-making, since the 1990s there has been a growing recognition and support for the participation of non-elites.

Traditionally, pollution control relies on structural rather than non-structural processes. However, structural processes are insufficient given the growing complexity and uncertainty characteristic of contemporary water resources challenges, particularly non-point source pollution. The focus is, therefore, on moving towards building adaptive cross-sectoral capacities accommodating both new and traditional forms of knowledge to address the changing dynamics of social-ecological systems. The process of social learning is a way of enhancing stakeholder participation.

A growing body of literature contends that the most effective way for ordinary citizens to be represented is through culturally-sensitive NGOs and CBOs that can articulate their needs and priorities. However, concern has been expressed about the extent to which such organizations can ever be truly representative. In the case of the Ganges, some have proposed public participation through “Ganga Panchayats”, based on the rural model of local self-governance in India, that would provide a deliberative platform for members of civil society. Such a space would help pool local knowledge about the Ganges while allowing ordinary citizens to play a role in the planning and adaptive management process. While this appears to be a step in the right direction, it is important to exercise caution in moving forward.

The NGRBP unlike the GAP has incorporated basin-level planning, which makes public participation an important component. However, simply embracing the vocabulary of participation does not ensure that it will be successfully implemented. Countries across the world have adopted progressive, participatory water governance. For instance, in 1998, the National Water Act of South Africa established water as a national resource, owned by the people of South Africa. The law established a Water Reserve to ensure water allocation to meet basic human needs and to support ecosystem functions. The Water Reserve is guaranteed as a right and has priority over licensed users. The law also outlined provisions for the creation of catchment

management agencies responsible for drawing up a management strategy for the catchment and emphasized community participation.

The NGRBP is an ambitious program that intends to overcome the shortcomings of the GAP in this regard but its litmus test lies in its implementation. No one agency is equipped with the financial and human resources necessary to check non-point source pollution. Enforcement of regulation can be expensive, which makes it necessary to encourage voluntary action. Partnerships with the private sector, community based organizations, and users of the waterfront, will, therefore, be crucial to support monitoring as well as assessment to evaluate the success of efforts to prevent pollution. Moreover, dissemination of information about water quality and actions to prevent pollution will be essential in cementing the long-term cooperation of all stakeholders. Without addressing some of the fundamental institutional problems associated with the provision of basic municipal services and enlisting the help of civil society groups to tackle non-point source pollution, the NGRBP faces the danger of falling into the same trap as its predecessor.

7. Conclusion

The Ganges has been accorded the status of National River. For several millennia it has occupied a special place in the sacred landscape of the country, and it will continue to do so well into the future. However, over the years, pressures of urbanization, accompanied by the growing threat of pollution, have called for serious attention. Pollution control programs GAP I in 1985 and GAP II in 1991 have attempted to clean the Ganges but have had little success. Projects under the GAP were woefully behind schedule and incurred major cost overruns. While the GAP was clear in terms of its goals, it suffered from a top-down, technocratic approach to problem solving lacked resources and institutional capacity as well as public participation.

REFERENCES

- [1] Ahmed, S. The rhetoric of participation re-examined: The state, NGOs, and the water users at Varanasi, Uttar Pradesh, India. *Environ.* 1994, 14, 3–16.
- [2] Alley, K.D. Urban institutions at the crossroads: Judicial activism and pollution prevention in Kanpur. *Urban Anthropol.* 1996, 24, 351–383.
- [3] Baviskar, A. Between micro-politics and administrative imperatives: Decentralization and the watershed mission in Madhya Pradesh, India. *Eur. J. Dev. Res.* 2004, 16, 26–40.
- [4] Biswas, A.K. Integrated water resources management: A reassessment. *Water Int.* 2004, 29, 248–256.
- [5] Biswas, A.K. Water policies in the developing world. *Int J. Water Resources. D.* 2001, 17, 489–499.
- [6] Blair, H. Participation and accountability at the periphery: Democratic local governance in six countries. *World Dev.* 2000, 28, 21–39.
- [7] Brannstrom, C. Decentralizing water resources management in Brazil. *Eur. J. Dev. Res.* 2004, 16, 214–234.
- [8] Central Pollution Control Board (CPCB). *Annual Report 1999–2000*; Government of India: New Delhi, India, 2000.
- [9] Dwivedi, O.P. *India's Environmental Policies, Problems and Stewardship*; St. Martin's Press: New York, NY, USA, 1997.
- [10] Eck, D.L. *Banaras: City of Light*; Knopf: Princeton, New Jersey, USA, 1983.
- [11] Feldman, D.L. *Water Policy for Sustainable Development*; Johns Hopkins University Press: Baltimore, MD, USA, 2007.
- [12] Global Water Partnership (GWP), *Integrated Water Resources Management*; GWP: Stockholm, Sweden, 2000; Technical Advisory Committee Background Paper No. 4.
- [13] Larson, A. Formal decentralization and the imperative of decentralization 'from below': A case study of natural resource management in Nicaragua. *Eur. J. Dev. Res.* 2004, 16, 55–70.
- [14] Litvak, J.; Ahmad, J.; Bird, R. *Rethinking Decentralization in Developing Countries*; The International Bank for Reconstruction and Development (IBRD): Washington, DC, USA, 1998.
- [15] Manor, J. User committees: A potentially damaging second wave of decentralization? *Eur. J. Dev. Res.* 2004, 16, 192–213.
- [16] Ministry of Environment and Forests. *Annual Report 1995–1996*; Government of India: New Delhi, India, 1996.
- [17] Mishra, V.B. Personal Communication. 2000; Department of Civil Engineering at the Institute of Technology, Banaras Hindu University, Varanasi, India.
- [18] National Council for Geographic Information. Cleaning up the Ganges River. Available online: <http://ncge.co/2011/09/30/cleaning-up-the-ganges-river/>.
- [19] Ostrom, E. *Governing the Commons: The Evolution of Institutions for Collective Action*; Cambridge University Press: Cambridge, UK, 1990.
- [20] Postel, S. *Liquid Assets: The Critical Need to Safeguard Freshwater Ecosystems*; Worldwatch Institute: Washington, DC, USA, 2005.
- [21] Ray, R. Ghats of Mathura and Vrindavan. *Architecture & Design* 1989, 16, 61–69.
- [22] Sinha, A. Nature in Hindu art, architecture and landscape. *Landsc. Res.* 1995, 20, 3–10.
- [23] Sivaramakrishnan, K.C. *Re-visioning Indian Cities: The Urban Renewal Mission*; Sage Publications: New Delhi, India, 2011.