

## Cleaning the Ganga, step by step

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Untreated sewage, industrial waste, reduced flow and rampant underground water withdrawals affect millions of people who depend on the Ganga's water. Picture shows the polluted river. The Hindu

***The task of reducing the pollution load of the Ganga is daunting, but the clamour for a cleaner river has gained momentum in recent times***

Traversing over 2,500 km, from the Gangotri glacier in the Himalayas to the Sunderbans delta in Bangladesh, the Ganga is used by hundreds of millions of people. This is one of the few river basins in India that is rich in water resources but highly polluted. How did one of the world's mightiest rivers end up as a garbage dump?

### **Myriad issues**

Issues affecting the river are myriad and complex. Untreated sewage and industrial waste are dumped into the waters without remorse. Reduced flow and rampant underground water withdrawals affect millions of people who depend on the river's water. Further, floods and droughts, which endanger lives and cause serious damage to crops, livestock and infrastructure, are a common phenomenon in the river basin. A changing climate will pose more challenges. The combination of glacial retreat, decreasing ice mass, early snowmelt and increased winter stream flow will add to the pressure. There is now clear evidence that climate change is already affecting the Himalayan ice cover. This will have a profound impact on the river.

However, all is not lost yet. Recent initiatives by the Indian government such as including 'River Development' and 'Ganga Rejuvenation' to the portfolio of the Minister of Water Resources, and the establishment of the National Ganga River Basin Authority and the National Mission for Clean Ganga, show a commitment to address some of these pressing concerns with special attention given to pollution control.

Even though the task of cleaning the Ganga is a daunting one, significant strides can be made toward achieving this.

## **Basin-scale management**

The Ganges is a complex transboundary basin which flows across different jurisdictions. Therefore, a basin-scale approach would help manage the water resources better. This would require close coordination with all the countries sharing the Ganga, such as Nepal and Bangladesh, so that the interests of both upstream and downstream users are taken into consideration. The existing treaties on “sharing water resources” could be renegotiated as “shared management of water resources.”

Second, the Ganga is highly polluted. Yet, of the 400 million people living along the banks of the river, many still rely on its natural systems for their livelihoods. According to a World Bank report, a number of government efforts (Ganga Action Plan: Phases I and II) have attempted to address the pollution problem, but the results have been disappointing so far. It is estimated that sewage constitutes the largest portion (80 per cent) of the pollution load followed by pollution caused by industrial discharge agricultural activities. With agricultural activities intensifying in areas near the river, particularly in urban and peri-urban areas, farmers frequently rely on waste water for irrigation. This poses a serious public health risk. However, this adversity can be turned into an opportunity as urban waste offers a significant nutrient resource for farming, if safely treated and applied. Low cost, simple ecological sanitation and reuse systems will be keys to making waste water treatment feasible for agricultural purposes.

## **Environmental flows**

Third, environmental flows are essentially the water requirements of aquatic ecosystems and of basic human, social and spiritual needs. However, the concept of environmental flow only refers to the the quantity of water required to maintain river ecology under different environmental conditions. Deteriorating water quality in the Ganga — due to domestic, industrial and agricultural effluents — is also a major threat to riverine ecosystems and to people whose livelihoods depend on water. Innovative methods for maintaining environmental flows and the quality of water during environmentally critical periods, along with procedures for implementing these methods, need to be investigated.

In cities, towns and industrial estates most vulnerable to flooding in the Ganges river basin, major investments are required to address climate variability. Existing flood forecasts are often too technical and not easy for the public to understand. Application of remote sensing and hydrological modelling has helped in developing high-quality flood maps, which are useful for developing plans for river conservation, maintaining the quality of water in different stretches and, more importantly, reducing the vulnerabilities of the affected communities.

Innovative approaches such as underground taming of floods for irrigation and aquifer management could offer solutions to the flood problem. These approaches essentially involve storing floodwaters in underground structures in upstream areas. This will help prevent floods and help maintain water availability even during dry seasons.

## **Toward a common goal**

In addition to the steps taken by the government to clean the Ganga, successful implementation of this task would require partnerships with various stakeholders. Multiple agencies working to address the problem could be brought on board. The private sector has also shown its willingness to be a partner in cleaning the river, especially at critical points such as Varanasi. Similarly, the public at large, along with civil society groups, also need to be actively engaged in these efforts.

In recent times, the clamour for a cleaner Ganga has gained momentum. Although huge progress is being made, the need of the hour is to widen our focus. Negotiations on economic revitalisation of the Ganga should involve India, Nepal and Bangladesh. This task in itself is of mammoth proportions. However, by taking small steps, we can still reduce the pollution load and restore the river to the people.

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