

When it comes to cleaning the Ganga, there is a great deal of talk and energy, especially with Prime Minister Narendra Modi putting his weight behind it. But are they enough?

# LESS A RIVER, MORE A TOXIC WATERWAY

## Clean up timeline



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Over 70% of the sewage that flows into the Ganga is untreated," says Hukum Singh, BJP member from Kairana in Uttar Pradesh and chairman of the parliamentary standing committee on water resources. Singh, whose committee submitted a report on the workings of the water resources ministry in late April, isn't exaggerating. As the Ganga makes its nearly 2,000 km journey through the plains of north India to the Bay of Bengal, it carries much more than the famed silt responsible for the fertility of the Indo-Gangetic plains. The holy river becomes a carrier of untreated industrial waste, garbage, agricultural run-off and municipal waste. All things that make it less of a river and more of a toxic waterway. By all accounts, the water in the Ganga is not fit for bathing, let alone consumption or farming. It has a high presence of total coliform and fecal coliform, a group of closely related bacteria - an indicator of the level of contamination of a water source or body - except in the upper reaches. The worst stretches are between Kanpur and Varanasi and then again in West Bengal beyond Dhakshinwar. It is in the stretch from Kanpur-Unnao to Rai Bareilly to Allahabad and Varanasi that the Ganga ceases to be a river and becomes a flowing body of filth. The Central Pollution Control Board, which is the apex body entrusted with tackling water pollution, reported in July 2013 that Uttar Pradesh contributes 76% of the Ganga's pollution load. Yet, the Ganga captures our imagination. The river is believed by millions of Indians to have the capacity to wash away one's sins and purify the living and the dead. Such is the power of the Ganga that politicians always make it a point to highlight their "dip" in the holy river. This, perhaps, would explain why prime ministers from Rajiv Gandhi to Narendra Modi put "cleaning" the Ganga on their to-do lists. Successive governments since 1985, when the Rajiv Gandhi government launched the

Ganga Action Plan, have sought to restore the river to its pristine form, or, to use Indian speak, ensure its "nirmal dhara." Some Rs 4,000 crore later, the dhara (flow) is no more nirmal (clean) than it was before. In fact, in the three decades that have passed, the Ganga has taken in more waste than it did before 1985. BD Tripathi, environment science professor at Banaras Hindu University and expert member of the National Ganga River Basin Authority, attributes rising pollution in the river to untreated domestic waste, industrial effluents and religious practices like cremation. To this shortlist, Anjum Parvez, a professor at the Law College Dehradun, adds growing population, poverty, unregulated urbanisation and improper agricultural practices.

**MAMMOTH TASK** Cleaning the Ganga is a mammoth task—the river traverses 66 districts and there are 118 towns and 1,657 gram panchayats on the river's main stem. Municipal waste is the major source of the river's pollution and although the quantity of industrial effluents is lower, experts say it's more harmful. In its 2014 order, the Supreme Court referred to studies to stress on the need to focus on curbing the flow of untreated waste, saying that industrial discharges were 10 times more noxious than domestic waste. The government is focusing on addressing municipal waste and industrial effluents to stem the tide of muck that makes it into the river. "People see the floating trash and say the Ganga is so dirty. Floating trash is minuscule. Our focus is on the big problem: municipal sewage, there are 144 drains following into the river. This is the biggest source of the pollution and this is where we will use the bulk of our resources. Then there is industrial effluents. We have to ensure that no waste and untreated water flows into the Ganga," said a senior official with the National Mission for Clean Ganga. At present, some 7,300 million litres of sewage is generated every day in towns, cities and villages along the river. Sewage treatment plants can handle only about 2,126 million litres a day. Plants with a cumulative capacity of 1,188 million litres a day are under con-



**Money Spent on Cleaning the Ganga**  
Funds for Namami Gange for 2015-16 to 2019-20: **₹20,000 crore**  
Two components:  
A. Existing Govt liability for ongoing schemes: ₹ 7,272 crore  
B. New Initiatives: ₹ 12,728 crore

Money Spent since 1985: ₹4,168.55 crore over 35 years under 927 schemes under seven initiatives, including the Ganga Action Plan I&II, Yamuna Action Plan I, II, & III. In all capacity for treating 2618.73 million litres of sewage every day was created.

## Problems and solutions with earlier efforts to clean the Ganga

Issues	Solutions
Huge gap in sewage treatment capacity	Increasing capacity to bridge gap with some redundancies
144 major drains discharging untreated sewage into the Ganga	Tapping of drains—intercepting and diverting untreated sewage to treatment plants
Open defecation	100% sanitation coverage for 1657 gram panchayats
Small industrial units discharging toxic untreated effluents	Sops for pollution abatement to industries
Ineffective interministerial & centre-state coordination	Three-tier monitoring mechanism
Delays in execution & implementation	Execution through PPP and SPV mode
Insufficient funds—states unable to give their share	100% funding by the central government
Inefficient operation & maintenance	A 10-year provision for O&M by the centre, after which state to provide funds for O&M for 5 years
Inadequate participation by local government institutions	Involving urban local bodies, gram panchayats, collectors
Inadequate public participation	Involving public, ex-servicemen living in areas adjoining the Ganga, businesses



struction or in approval stage. Even after discounting any increase in the quantity of sewage generated, the treatment capacity would still be far lower than required.

Another problem is under utilisation of capacity. In 2013, the CPCB reviewed 51 sewage treatment plants and found that while 15 of them were non-functional, the remaining 36 operated at 59% of capacity, hampered by factors such as lack of electricity.

Water resources ministry officials say they expect to bridge the "sewage treatment capacity gap of about 2,500 mld on the river Ganga main stem by 2018-19." The government has asked authorities in 118 urban centres that account for half the sewage generated to prepare and implement management and treatment plans. These centres—a mix of different classes of towns and cities including Haridwar, Varanasi, Patna, Allahabad, Kolkata and Rajmahal—generate over 3,636 million litres of sewage per day. The 55 sewage treatment plants servicing these centres can, at full capacity, handle one-third of the waste generated.

### ZERO-LIQUID DISCHARGE

An Indian Institute of Technology consortium set up for designing the clean-up operations advises adopting decentralised treatment of sewage with many small-capacity plants. It also suggests limiting the use of fresh water for drinking and bathing, while for everything else, the aim should be to first use treated water. To this end and to limit pollution of the river, the government has been pushing industry to implement a system of zero-liquid discharge. "Ideally the treated water should be reused. However, a wastewater market is yet to be established in India. We recently held a market conference with 268 industry partners to encourage re-use," an official said. With the National Green Tribunal and the Supreme Court taking active interest in addressing pollution of the Ganga, the government has made it mandatory for industries across 17 sectors to put in place online monitoring and zero-liquid discharge systems by June 30, a three-month extension over the previous deadline. The government says it is serious about

moving on industrial pollution—taking steps to ensure compliance, including disconnection of electricity supply. Officials told the parliamentary committee that the environment ministry and pollution control board "should be able to—except for maybe pulp and paper—hopefully in the next one year achieve substantial results."

The Ganga's pollution problem may be exacerbated by reduced water flow from the large number of hydropower projects in the upper reaches in Uttarakhand, which lowers its self-cleaning ability and curbs dilution of waste. The government has told the Supreme Court that it intends to maintain a flow of 1,000 cubic metres a second in the river.

### LOCAL INVOLVEMENT

Parvez, in a paper published in the Dehradun Law Review, had suggested more effective implementation of laws dealing with prevention and control of river pollution, along with increased public awareness about the importance of keeping rivers clean. This would save rivers and eliminate expenditure on cleaning efforts, he said. Officials at National Mission for Clean Ganga say that past efforts to clean the river failed because it didn't involve local bodies, businesses, citizens' groups or public participation. "It would be the easiest thing for us to step in and procure the aerators, or trash skimmers but then who will use and maintain it? Local bodies must have a stake in this effort. Sustainability involved with community participation," a senior official said.

When it comes to cleaning the Ganga, there is a great deal of talk and energy, especially with Prime Minister Narendra Modi putting his weight behind it. But are they enough? That's a sentiment echoed by Supreme Court Justice TS Thakur: "How far will the government's renewed zeal make any difference on the ground is for anyone to guess. What is, however, clear is that if the mission has to succeed, all those concerned will have to rededicate themselves to the accomplishment of the cause that will not only cleanse the holy river but comfort millions of souls that are distressed by the fetid in what is believed to be so holy and pure that a dip in its water cleanses all sins."

# AND THEN THERE IS ARSENIC CONTAMINATION

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**New Delhi:** There's more than that ails the Ganga basin than meets the eye—large swathes of the region's groundwater are affected by arsenic poisoning, a health hazard that's been largely ignored while the government focuses on reducing the flow of toxic industrial and municipal waste into the river. While the cause has not been definitively established, the fact is that even though about 70 million people are vulnerable to direct poisoning, there has been no policy intervention aimed at addressing the issue for four decades. The first report of arsenic contamination came in 1976 from Punjab, which warned: "The possibility of more widespread groundwater arsenic contamination, particularly in the Ganga river basin, might be found in the future." The future came six years later. In 1982, West Bengal reported arsenic contamination of groundwater. Between 2002 and 2009, reports came in from Uttar Pradesh, Bihar and Jharkhand—all along the

course of the Ganga. It's not clear exactly how widespread the problem is. Depending on the agency reporting, the number of affected districts varies from 71 in nine states to 88 in 10 states—there is no official figure. All the lists have some 40 districts along the Ganga in common. In Uttar Pradesh, 20 districts along the river report arsenic contamination in the groundwater. Of the 15 impacted districts in Bihar, 12 are located along the river. In Jharkhand, contamination has been reported in areas close to the Ganga and areas where the river has shifted recently and in eight districts in West Bengal. Is there something in the silt that the Ganga brings along and deposits in the plains? Or is increased human activity that led to the spurt of arsenic contamination? Scientists and experts have a range of explanations. KJ Nath, chairman of the Arsenic Task Force of the West Bengal government, says the crisis is due to "geo-morphological reasons"—or simply put, natural causes. The problem is that arsenic levels are too high. In many districts, the level of arsenic is as

high as 3 mg per litre, way above the World Health Organisation's acceptable safe level of 0.01 mg per litre and even the safe level of 0.05 mg per litre set by the Bureau of Indian Standards. Not all experts are confident of ascribing arsenic contamination solely to natural sources. "The elevated levels of arsenic in groundwater is caused largely by natural

process and partly due to anthropogenic activities like application of fertilisers, burning coal, leaching from coal ash tailings and from mining," according to officials from the Ministry of Water Resources, River Development & Ganga Rejuvenation. Scientists point to the increased usage of coal usage—the average arsenic content in Indian coal ranges from 0.15 to 0.40 mg per

kg, way above acceptable limits. Experts say leaching of arsenic during coal washing and combustion leading to ash contaminates water bodies. Add to this the overuse of fertilisers, pesticides, herbicides and fungicides, which often contain high dosages of arsenic.

The timelines of reports of arsenic contamination fit with the increased use of fertilisers introduced in the mid-seventies. Arsenic contamination of groundwater is not limited to the Ganga river basin. But given that the Indo-Gangetic plain is the chief food producing area, including the fish obtained from the river, the problem takes on a larger magnitude. The Indian Council for Agriculture Research says that 90% of the groundwater in arsenic-affected areas is used for irrigation, meaning food crops grown in the area and sold outside carry with them doses of arsenic, making the problem more widespread. The Parliament's Estimates Committee headed by BJP MP Murlu Manohar Joshi submitted a report detailing arsenic contamination of groundwater in December and found that although the problem is four

decades old, with more than 70 million people in 35 districts doomed to be exposed to groundwater arsenic, there has been no real policy intervention. The National Water Policy of 2012 has no reference to arsenic contamination. Worse, there is no proper monitoring of arsenic contamination.

Arsenic consumed on a sustained basis is harmful to humans, causing illnesses such as hyperpigmentation, keratosis, anaemia, swelling of legs, liver fibrosis, chronic lung disease, gangrene, neuropathy and cancer. Some experts put the death toll on account of arsenic poisoning at 1 lakh and say that there are 2 to 3 lakh confirmed cases of illness. Despite the magnitude of the problem, central agencies don't have any data on arsenic's impact on public health. Although the source of arsenic poisoning is as yet unidentified and may be natural, the increase appears to be on account of human activity. However, there is no proper monitoring and if the Ganga and its basin are to be restored to its glory days, this is one problem that the government can't ignore.



Cooling off in the Ganga in a pool of domestic and industrial waste