

Management of Gomti River water in Lucknow City by Making Changes in

Structure of The Gomti River Front

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INTRODUCTION:

A river is the lifeline of the area which it drains same is the case with Gomti River. The Gomti River, an alluvial river of the Ganga Plain and one of the important tributaries of the Ganga, originates near Mainkot, from a lake– ‘FulharJheel’ in Madhotanda, about 30 km. east of the Pilibhit town in Uttar Pradesh at an elevation of 185 m. The river flows through an incised valley southwards through the districts of Sitapur, Lucknow, Barabanki, Sultanpur and Jaunpur before meeting the Ganga River at Kaithi, District-Ghazipur, bordering Varanasi (at an elevation of 61 m.) after traversing 950 km. in south south-east direction. The characteristic of the river is perennial. The total drainage area of the river is 30,437 sq. Sitapur, Lucknow, Sultanpur and Jaunpur are the four major urban settlements on the banks of the river. The river, subsequently, receives the untreated waste-water and effluents from these locations in its course, through more than 45 major drains. Throughout its stretch, there are many tributaries such as- Kathina, Bhainsi, Sarayan, Gon, Reth, Sai, Pili and Kalyani, originating within short distances and carrying the waste-water and industrial effluents from different towns and industrial units in the basin. Besides Lucknow, Gomti River supplies drinking water to other towns located on its banks. These include Lakhimpur Kheri, Sultanpur and Jaunpur.ⁱ

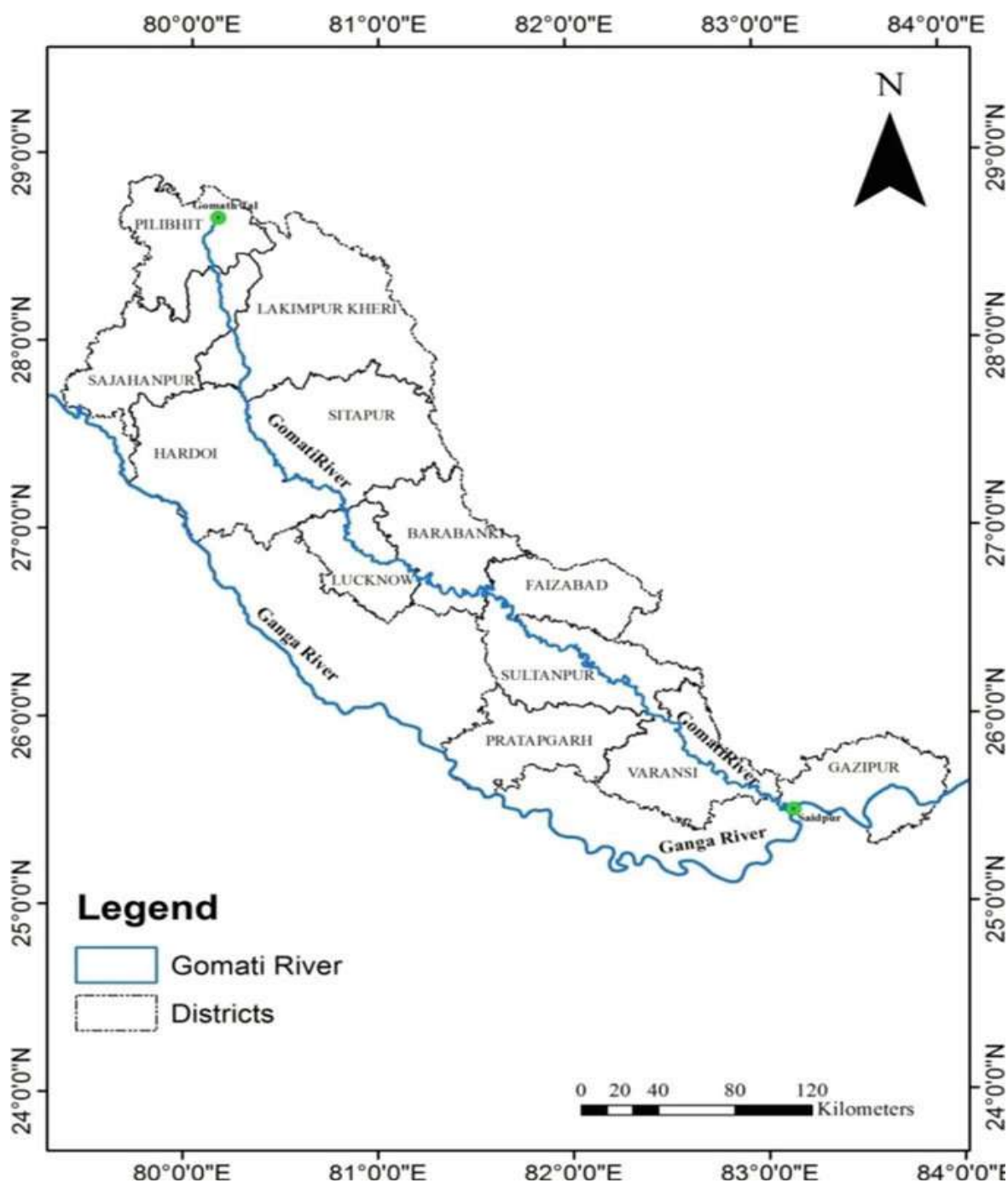


Fig.1: Map showing the course of Gomti River

While each of the above towns pollute this river, the condition is the worst in Lucknow where most of the stretch of the river look like a drain. The river is under ‘assault’ at various points of its journey from downstream of Sitapur to upstream of Sultanpur, as it meanders through the industrial belt of sugar processing, paper and plywood industries. From industrial effluents to domestic discharge, the river becomes more of a flowing dumping yard for the 15 smaller and bigger towns- Lucknow, Sultanpur and Jaunpur, in its catchment area. The river is still somewhat clean as it cleanses itself through a natural oxidation process when it approaches Balaganj in Lucknow. Balaganj is around 350 km.

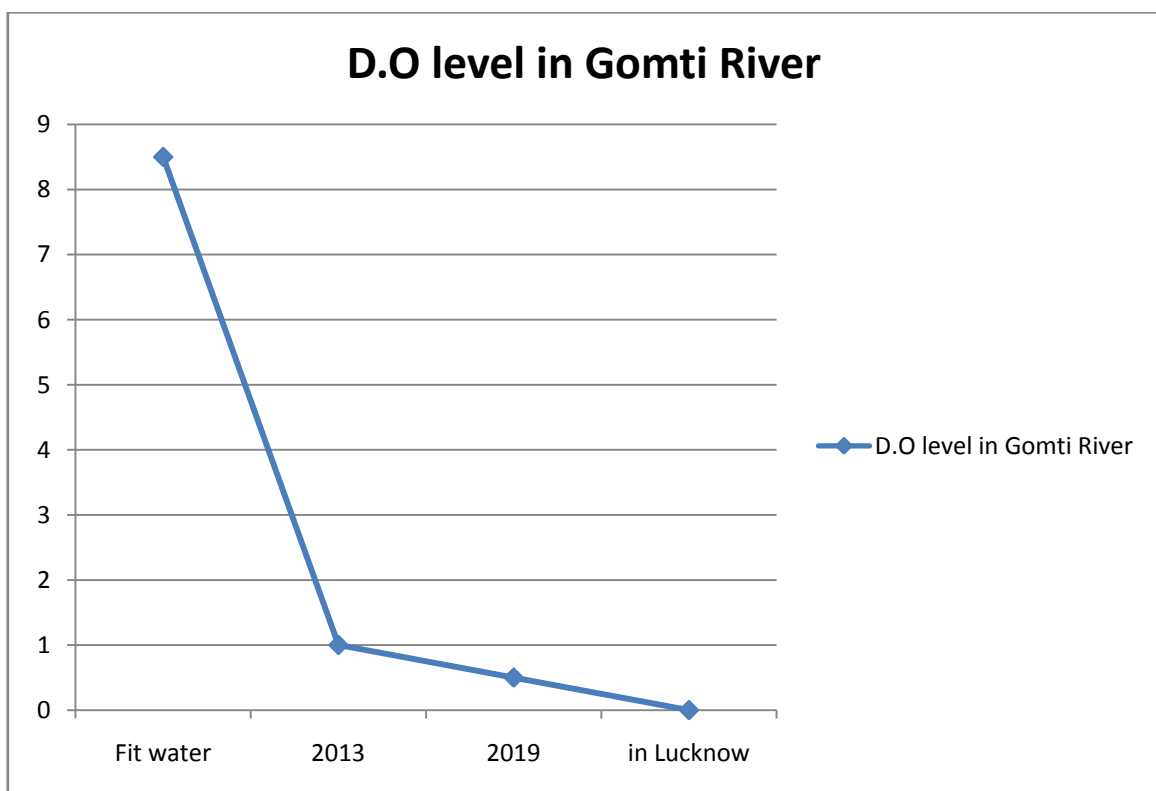
away from FulhaarJheel. It is here in Balaganj that the British had set up a raw water pumping station– the Gaughat pumping station. The river meanders for another 12 km. through the middle of the state capital and then shrinks. The surging 25 big nallas and several small nallas fill the river with domestic discharge. Thus at Gomti barrage, the river is reduced to a mere ‘dead’ water body. The flow becomes almost negligible and the dissolved oxygen diminishes.ⁱⁱ

The Dying Gomti...

The Gomti river in India’s most populous and political heartland state of Uttar Pradesh is dying. A survey has found that the condition of the river is so bad that the water in it is no longer fit for human consumption or able to sustain aquatic life.ⁱⁱⁱ

It was found that the dissolved oxygen (DO) in the river has dipped to 0.5 mg/litre. It should be at least 8.5 mg/litre to make the water fit for human consumption while a drop below 5 mg/litre makes it unfit for flora and fauna. In 2013, the level recorded was 1 mg/litre.

While in Lucknow the dissolved oxygen level was reported to be 0.



Graph 1: Showing Dissolved oxygen level in Gomti river

The extent of pollution is such that the river's biodiversity is being affected. A marine species of molluscs -- *Solariella* -- was recently found in the river. This is alarming, as *Solariella* is endemic to coastal waters that ordinarily have high levels of ph (read: alkaline/ polluted conditions). The presence of *Solariella* was revealed during the first-ever bio mapping of the river done by the Geological Survey of India (GSI), Lucknow. In other areas such as Madhavpura, Isauli and Bashariaghat, GSI scientists found *Hemicypris arorai* -- another organism that survives in highly alkaline water (ph values of 8.2 to 9.1).^{iv}

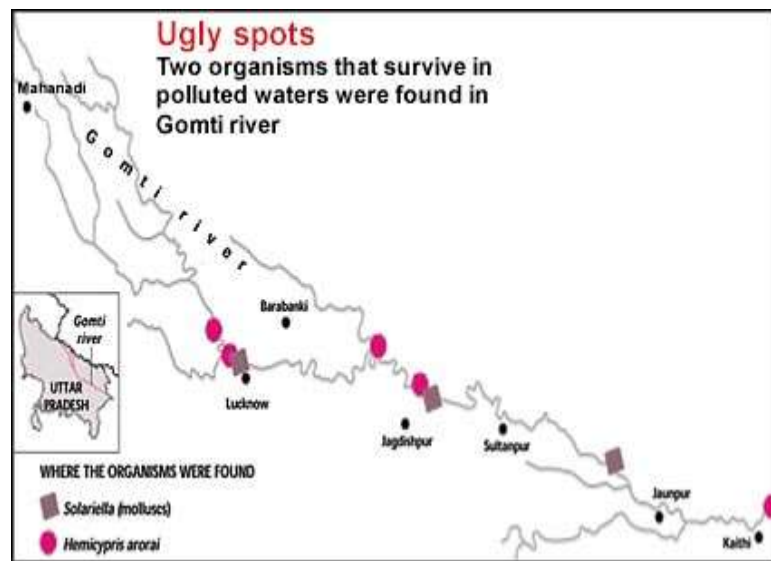


Fig.2: Showing the places with organisms that can survive in polluted water

What is River front and why need of constructing it was felt?

Gomti Riverfront project is a project based on the model of Tokyo and Osaka cities of Japan, which was built by the Irrigation and Water Resources Department under the Irrigation and Water Resources Ministry for the purpose of rejuvenating the Gomti River which was on the verge of being dead. The budget of whole of the project was about **Rs. 967.00 Crore** which include **Rs.656 crore** from channelization of Gomti River and **Rs.311 crore** for trunk drain.

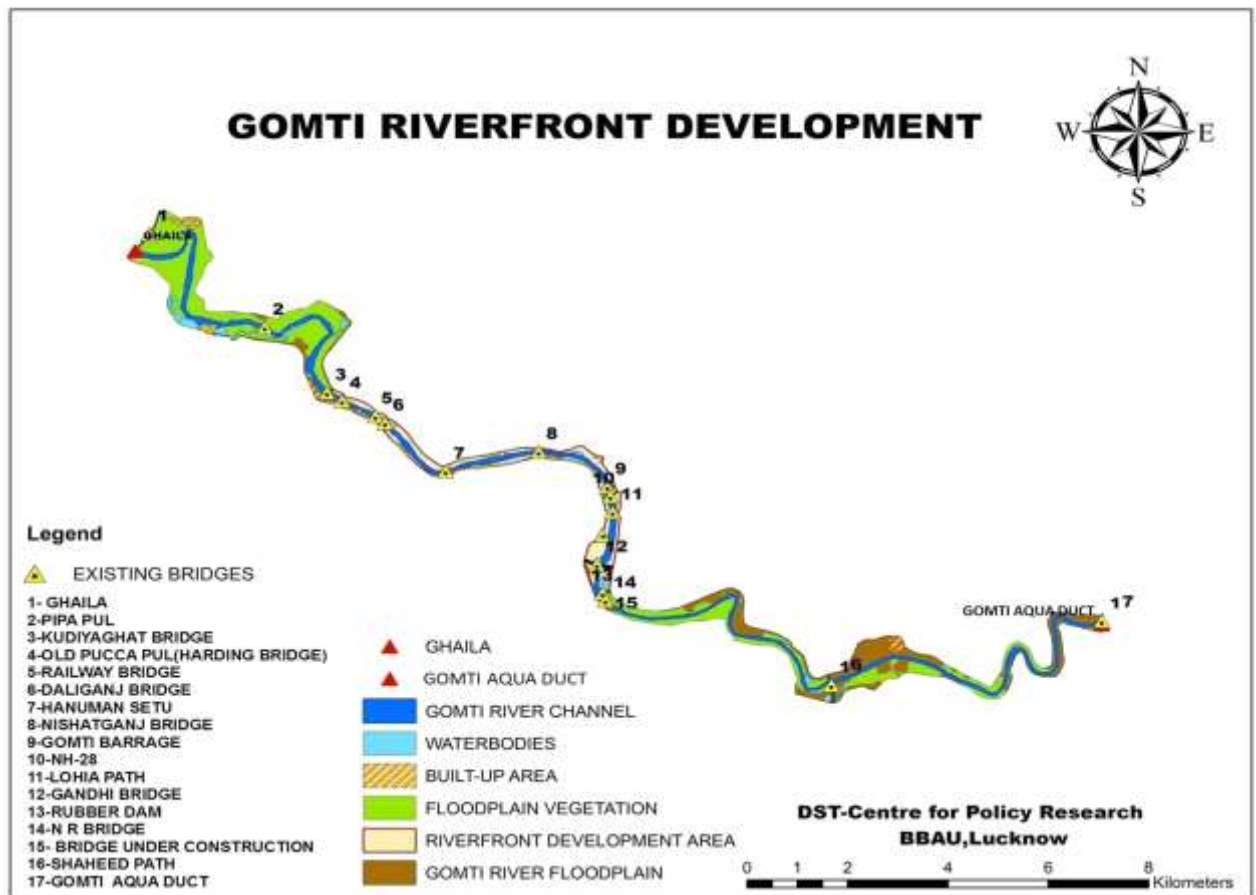


Fig 3: Riverfront Development across Gomti river^v

Under this Project, the following works are included: -

- ❖ De-silting of the river from Harding Bridge to Gomti Weir.
- ❖ Channelization of Gomti River by constructing Diaphragm Wall from Harding Bridge to Gomti Wier.
- ❖ Works of Beautification and development of a green belt along both sides of the Gomti River.
- ❖ Proper illumination of all the structures including barrage, bridges and along both banks in the proposed part of the Gomti River.

To ensure uninterrupted water into the Gomti River, the Mahdoiya and Ataria escapes of the Sharda Canal System were rejuvenated and connected with the Gomti River.^{vi}

Available Data:

The following data were made available by the project authorities.

- (a) Toposheet of the Gomti river from Kudiaghat to Gomti Barrage including bridges across the river and other structures in vicinity of the river.
- (b) Cross-section of the Gomti river from Chainage 0 (Gomti barrage) to 68000 m upstream at interval of 200 m.
- (c) L-section of Gomti river from Chainage 0 (Gomti barrage) to 6800 m.
- (d) Name of bridges and their length from one abutment to other along with their location.
- (e) GAD of the Nishatganj Bridge, Dalignj Bridge, Railway Bridge, and Harding Bridge.
- (f) Details of Hanuman Bridge in terms of water way, lower and upper crown levels, shape and sizes of piers etc.
- (g) Yearly peak discharge and corresponding HFL at Hanuman Bridge in period 1969-2010. Maximum recorded discharge in Gomti river in period 1923 to 1959 is 75000 cusecs. The ever-maximum discharge equal to 125890 cusecs was recorded in year 1960.
- (h) Recorded daily maximum water level at Nimsar, Bhatpurwa, Gaughat, Hanuman Setu, Gomti Barrage in the month of August of year 2008.
- (i) Recorded HFL, river bed level, top levels of both the banks, and average width of river from Chainage 0 to Chainage 6370 m. The bed level of river as in year 1960.
- (j) Details of drains joining the Gomti river at its different chainages.
- (k) Particle size gradation of bed material of Gomti river from different depths & locations.^{vii}

Problems:

The policy makers were of the view that all this will decrease the problems of water pollution, low D.O.levels, flooding and also for beautifying the river as it was turning into a *naala*. But the result turned out to be contrasting, as the creation of the riverfront is causing more harm than good.^{viii}

- ❖ There are many lobbies here -- the concrete lobby, the cement lobby, and many others. The biggest problem is that the engineers and project developers fail to understand that rivers have a breathing space area which should be left untouched. They don't understand how rivers function. They treat them like canals. They know how to take water out from the river, but they don't know the science behind replenishing it.
- ❖ The river's only source of replenishment is ground water. The riverfront project disrupted the link between the river and groundwater. The engineers wanted to develop the Gomti like the Sabarmati was developed. But they forgot that they are two separate rivers. No one was against the idea of beautification of the river. They could have had playgrounds or promenades, but instead they built concrete walls on either side. When the creation of concrete walls was opposed the engineers said that they have installed the PVC pipes as if they didn't know that water seeps through grass and sand not through the pipes and these concrete walls lead to suffocation of the river and the life in it as the fresh water supply was interrupted.
- ❖ Apart from this a lot of garbage is being thrown by the visitors in the river on the daily basis and due to low D.O. levels a lot of fishes are dying leading various impurities in the water as well as the area smells very badly there is rarely any cleaning work done there.
- ❖ There has also been an economic drawback of the project as now there is no boating point left, leading to many boatmen losing their daily bread.

Solutions:

- ❖ **Setting up STPs:** Asia's largest sewage treatment plant was set up in Bharwara but it failed due to irregular supply of electricity. In order to clean the water a proper STP is a necessity hence a STP should be there with all kind of services required for its functioning.
- ❖ **Creating Rain Garden:** The remaining part of the riverfront project where the construction is left can be converted into a Rain Garden (a method of Rain water harvesting) which is a sunken landscape that uses native plants, local soil, and mulch to remove pollutants from water, and allows it to percolate into the ground. It's easy to create, looks good all year-round and has a positive impact on the

environment. This will make fresh water available to the river and will also support the marine life.^{ix}

- ❖ **Ban on throwing of Garbage in the river:** People throwing garbage in the river or nearby areas should be charged with heavy fines.
- ❖ **Rebuilding boating points:** Boating should be promoted as a leisure activity and the boating points would be rebuilt so that those boatmen who have no jobs get the justice.
- ❖ **Cleaning the river regularly:** The river should be cleaned regularly in order to keep the water and the surrounding away from foul smell as well as to it is necessary to save the riverine animals.
- ❖ **Treating nature above one's greed:** Last but not the least the nature is and will be always be superior to man and hence man should treat it with respect and keep it safely, as the upcoming generation will need these resources.^x

The riverfront was an ambitious project which led to a high degree of imbalance in river system but the above-mentioned measure can be adopted reduce its ill effects and to improve the conditions.

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