
Pollution Analysis of River Ganga in Kanpur Region

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Scope of Study

The Ganga basin accounts for a little more than one-fourth (26.3%) of the country's total geographical area and is the biggest river basin in India, covering the entire states of Uttarakhand, Uttar Pradesh (UP), Bihar, Delhi, and parts of Punjab, Haryana, Himachal Pradesh, Rajasthan, Madhya Pradesh, and West Bengal. Main stem of river Ganga houses a population with high density. In absence of proper sanitation, abstraction of surface and groundwater for irrigation and drinking purposes and partially treated domestic and industrial effluent turns Ganga into a polluted river in the stretch from Kannauj to trighat in the state of Uttar Pradesh and also makes the water of river Ganga unfit even for bathing purposes. Kanpur is one of the major contributors to the pathetic water quality of river. The study area of Kanpur City (longitude 80°14' E and latitude 26°30' N) is situated at an approximate distance of 435 km SE from Delhi on the right bank of river Ganga and Jajmau industrial area is situated on its downstream side. Large number of industrial establishments (mostly tanneries) at Jajmau has made enormous ramifications upon the habitability in its surroundings. Partially treated industrial effluent coupled with domestic sewage from Kanpur City is discharged into the adjacent river Ganga, resulting in worst quality of water in river Ganga in this part of city. Idea is to identify drains and industries responsible for continuous degradation of water quality of river Ganga

Problem statement

it was observed that river Ganga within the prescribed limits in terms of BOD from its origin to Rishikesh and in the segment of Bihar. However, in the stretch of Rishikesh Downstream to Garhmukteshwar and Kannauj Upstream to Trighat and few locations at West Bengal (Dakshineshwar, Uluberia & Diamond Harbour) water quality exceeds the criteria in terms of BOD. Dissolved Oxygen & pH is meeting the criteria at almost all the monitoring locations while Faecal Coli form is not meeting the criteria at most of the monitoring locations from Kanpur Downstream onwards up to Diamond Harbour. It is estimated that Kanpur generates 450 MLD of sewage every day as well but the existing infrastructure can only treat around 160-170 MLD, remainder goes directly into to river untreated.

Methodology

Grossly Polluting Industries (GPI) are defined as the industry which is discharging wastewater more than 100KLD and/or hazardous chemicals used by the industry as specified under the Schedule-I, Part-II of The Manufacture, Storage and Import of Hazardous Chemical Rules of 1989 under Environment (Protection) Act, 1986. Analysis of BOD loading in Uttarakhand, Uttar Pradesh, was done. Drains and industries discharging water in River Ganga were identified, the respons of BOD and other water quality parameters was observed to the inflow.

Result

A total of 764 grossly polluting industries were indentified discharging wastewater to main stem of River Ganga (either directly or through drains) and its two important tributaries Kali-east and Ramganga in Uttarakhand, Uttar Pradesh, Bihar and West Bengal. It was observed that water consumed by grossly polluting industries is 1123 MLD. In terms of number industrial units, tannery sector is dominating where as in terms of wastewater generation Pulp & paper sectors dominate followed by chemical and sugar sector. It is also observed that GPI in Bihar generate minimum wastewater (19%) in terms of water consumed whereas GPI in West Bengal generate maximum wastewater 75.5% in terms of water consumed this followed by Uttarakhand (56.7%) and Uttar Pradesh (39%).

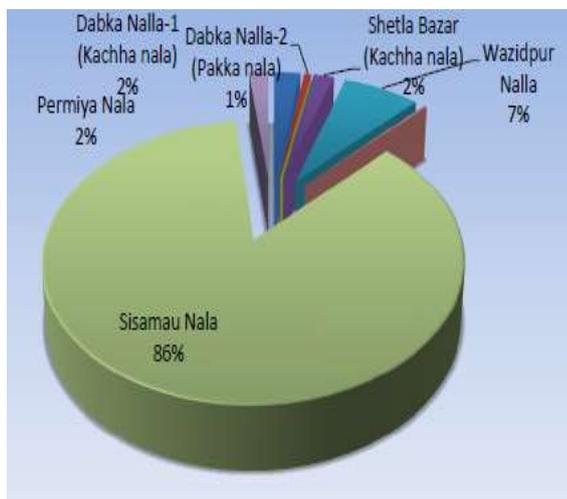


Fig 1: BOD load distribution of catchment in Kanpur

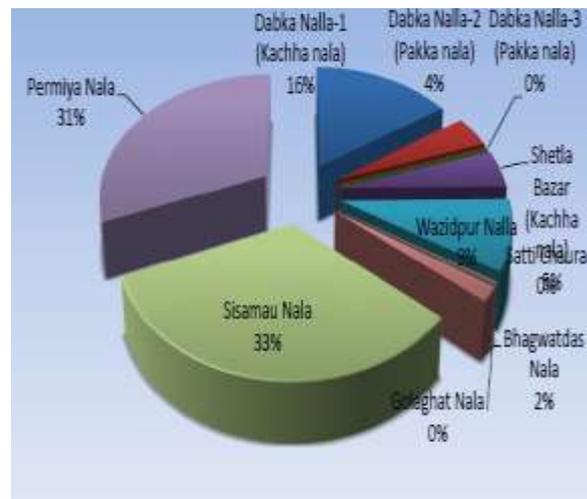


Fig 2: Pie chart showing flow distribution of drains located in Kanpur region

A total of 138 drains were identified, discharging 6087 MLD of wastewater. In Uttarakhand 14 nos. of drains are discharging 440 MLD of industrial and domestic wastewater directly/indirectly to river Ganga. Uttar Pradesh discharges 3289 MLD of industrial and domestic wastewater through 45 drains. In Bihar total 25 no of drains are identified, discharging 579 MLD of wastewater to river Ganga. 1779 MLD of wastewater discharges to river Ganga through 54 drains in West Bengal

Implication

Water is one of the most essential natural sources for sustainable life and it is likely to become critically scarce in the coming decades because of the majorly polluted environment due to rapid increase in the population, increasing demands. Especially, River water is one of the Essential drinking water sources entire the world because most of the village areas are situated along the river basins and the people living in villages will use river water as drinking purpose. Uttar Pradesh has 687 grossly polluting industries, finds CPCB. These largely small scale, often illegal units—tanneries, sugar, pulp and paper and chemical—contribute 270 mld of wastewater. But what really matters is the location of the plants. While over 400 tanneries contribute only 8 per cent of the industrial discharge, they spew highly toxic effluent into the river and are located as a cluster near Kanpur. So the concentration of pollution is high. It is alarming that not much is happening to control pollution. In 2013, an inspection of 404 industrial units by CPCB showed that all but 23 did not comply with the law.

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