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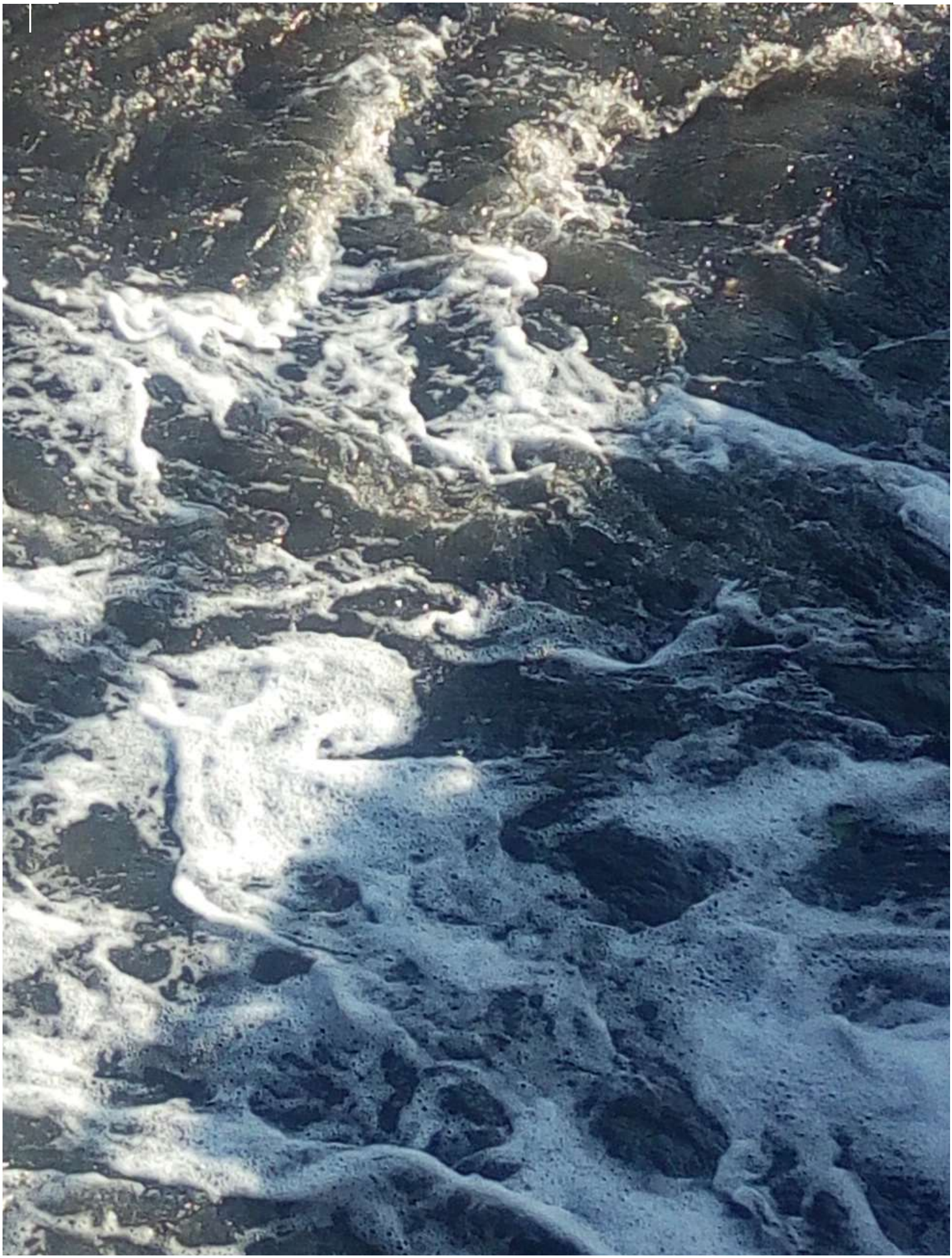

URBAN WATER SECTOR

Indore is Still Very Much Water Minus!!

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Guest Blog: Rahul Banerjee

Recently, the city of Indore was declared the first Water Plus city in India under the Swachh Sarvekshan programme of the Ministry of Housing and Urban Development for its ostensibly exemplary waste water management (Hindustan Times, 2021). However, the reality is quite different as a detailed study of the prevailing wastewater management situation in the city shows.

The Indore Municipal Corporation (IMC) is spread over an area of 276 sq kms with a population of about 3.1 million in 2021 (IMC, 2021). The Rivers Khan and Saraswati drain the city of Indore and a considerable part of the sewage would earlier also drain into these rivers. Over the past few years, a massive programme has been undertaken to tap these open drains and outfalls, numbering in thousands, that were discharging untreated wastewater into these rivers, by laying sewers along their banks and then directing the wastewater to seven new Sewage Treatment Plants (STPs) constructed at intervals along these rivers. Currently there are about 1100 kms of sewers in the city. There was already a group of STPs downstream of the city at Kabitkhedi along the river Khan to treat the wastewater from the sewerage system laid in the city but they were partially treating only about 100 Million Liters Per Day (MLD) of the total wastewater of 320 MLD or so that is generated as there were not enough sewers to carry the wastewater to them.

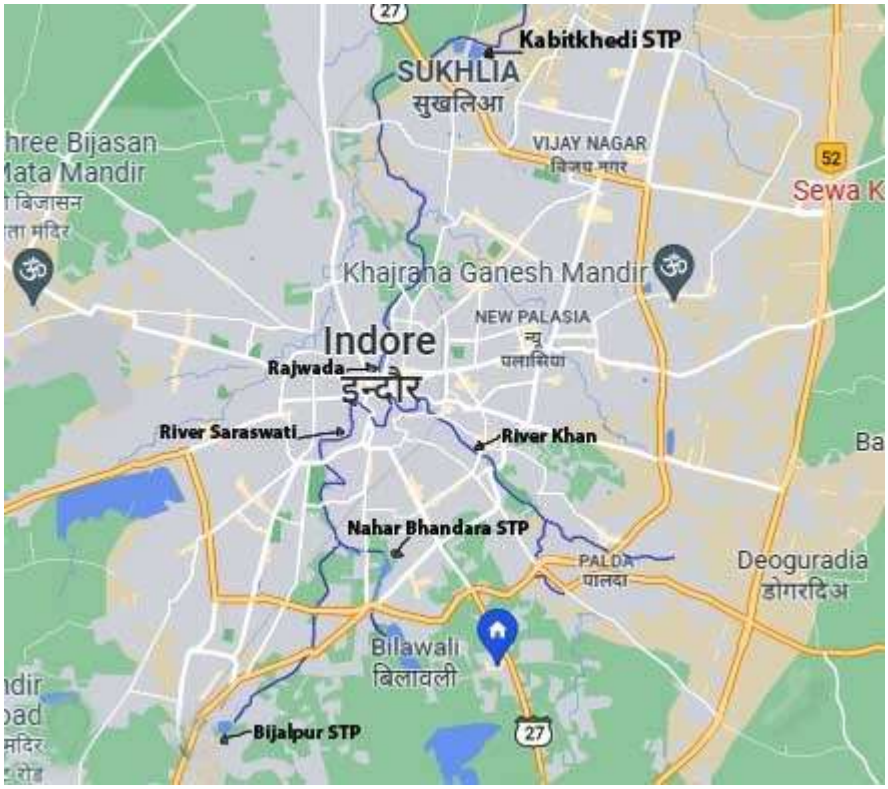
Now, with the tapping of all the thousands of outfalls and treatment of the wastewater in the seven new STPs constructed along the rivers and greater flow to the Kabitkhedi group of STPs as a consequence of new sewers being laid, 312 MLD of wastewater is being partially treated and some of this is being reused in washing roads and in maintaining the various gardens and parks while the rest is being released into the rivers (Free Press, 2021a). While the improvement in water supply from the Narmada River and the treatment and reuse of wastewater has made the city best in water management in India, this has been achieved at a huge capital cost of thousands of crores in laying sewer lines, tapping outfalls and augmenting treatment capacity. The details of the operating and maintenance expenditures in wastewater management of IMC is given in Table 1 below.

Table 1: Finances of Water Supply and Waste Water Management of IMC

Account Categories	Actual	Expenditure &	Income (Rs Cr)
	2017-18	2018-19	2019-20
Exp on Sewage and STPs	12.94	36.44	26.58
Drainage Cess Income	26.00	18.66	23.00

Source: Budgets of IMC for 2019-20, 2020-21 and 2021-22

Expenditure on sewerage and STPs was less in 2017-18 when the sewer lines were less in length and the STPs were not being run as much. In 2018-19 the expenditure increased because more STPs began functioning and the shortfall in drainage cess increased to 48.8 percent. The expenditure paradoxically fell in 2019-20 and so the shortfall was less at 13.5 percent. This was because the STPs were not run regularly in that year as will become clear later. Faced with this shortfall in cost recovery, the IMC announced a hike in water taxes, to double of what they were earlier and introduced a new sewerage tax to become effective from April 2021. However, this was immediately met with opposition from the citizens and both the ruling party and opposition politicians pressurised the IMC to withdraw this proposed hike (Free Press, 2021b).



Map showing key locations mentioned here

This clearly shows that the provision of centralised sewerage services on a regular basis is economically unsustainable. The finances of sewerage and sewage treatment are analysed further below to underline this economic unviability of centralised systems.

Table 2: Comparison of Actual O&M Exp on STPs and Sewers with Standard Exp. (2019-20)

Type of Service	Total Quantity Treated	Standard Annual Expenditure Per MLD or K (Rs Lakhs)*	Total Standard Annual Expenditure (Rs Crores)	Actual IMC Expenditure on Sewerage and Treatment (Rs Crore)	Shortfall (%)
STP	320 MLD	30	96.0	Not Available	NA
Sewerage	1100 KM	5	55.0	Not Available	NA
		TOTAL	151.**0**	**26.58**	82.**4**

Source: Municipal Budget of IMC 2019-20, 2020-21 and 2021-22

* Compendium of Recycle and Reuse of Wastewater in 54 million plus cities, Central Public Health and Environmental Engineering Organisation & Ministry of Housing and Urban Affairs, GoI, September 2021

Clearly, the IMC is underspending by a very large proportion on sewerage and treatment and especially on treatment. This becomes clear once we study the actual operation of the STPs in Indore. The total installed capacity of STPs in Indore is 402 MLD which can easily treat the 320 MLD of wastewater that is generated in the city. However, in reality this is not taking place due to shortage of funds and all the STPs are being run at much lower than design capacity and most of the wastewater is being bypassed. The first STP is on the River Saraswati in Bijalpur above a dam that had earlier been built on it and this is supposed to treat all the wastewater from the part of the city above it. The picture below shows that the dam below the STP is badly eutrophied with water hyacinth growth indicating that it is treating only part of the wastewater and bypassing the rest either untreated or partially treated into the dam.

Bijalpur STP and the Reservoir below it, Eutrophied with Untreated Wastewater *(Photo by Rahul Banerjee)*

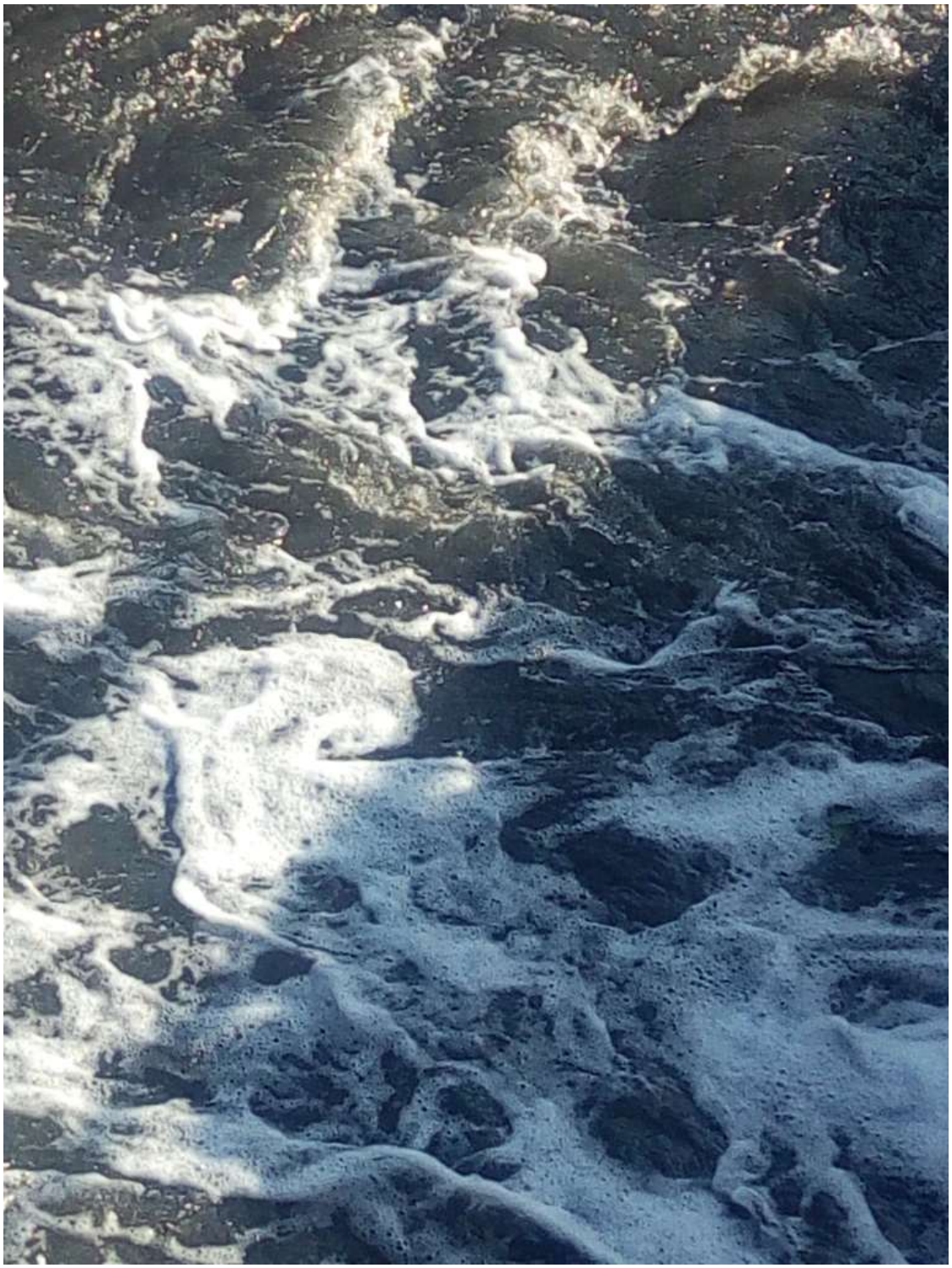
The next STP to which the tapping sewers along the River Saraswati and one of its tributaries is directed is at Nahar Bhandara and this too is bypassing most of the wastewater coming to it as can be seen in picture of the chamber through which water is supposed to come into the STP.

The Inlet Chamber of Wastewater into Nahar Bhandara STP bypassing it without treatment *(Photo by Rahul Banerjee)*

Consequently, the river near this STP is completely covered with water hyacinth as shown in the picture below.

River Completely Covered with Water Hyacinth near Nah*ar Bhandara STP (Photo by Rahul Banerjee)*

The flow of wastewater from the tapping sewers in the upper reaches of the River in Bijalpur and Nahar Bhandara is not much and so even after bypassing the wastewater the river isn't that polluted. However, near the city centre which is known as Rajwada because of the Holkar king's palace situated there, the two Rivers Saraswati and Khan meet. Here the flow of untreated wastewater is considerable and so the water is very polluted. As the combined River Khan flows down the city it gets more untreated waste water and reaches the main STP on its banks at Kabitkheri. Here the wastewater from the sewers of the city is once again only partially treated and mostly by passed to add to the polluted water of the river as is evident from the picture below of foaming dark polluted flow.



Foaming Dark Polluted Flow *in Khan River at Kabitkheri (Photo by Rahul Banerjee)*

The water in the River Khan at Kabitkheri was tested for various parameters and the results are in given in Table 3 below.

Table 3: Test Results of Khan River Water at Kabitkheri

Test	Biochemical Oxygen Demand mg/l	Total Dissolved Solids mg/l Total Dissolved Solids mg/l	Total Suspended Solids mg/l Total Suspended Solids mg/l	Dissolved Oxygen mg/l Dissolved Oxygen mg/l	Total Coli-form**	Faecal Coli-form	Faecal Strepto-cocci	Ammon Nitroge mg/l
Observed Value	21	330	29	1	TNTC*	TNTC	TNTC	0.9
Permissible Value for Class A Water Sources (IS:2296)	3	500	20	>5	50	50	50	Absent

*Too numerous to count.
** Most Probable NO/100 ml

The test results establish that the water in the river at Kabitkhedi is highly polluted and not only is secondary treatment not being done properly in the STPs but tertiary treatment of chlorination is also not being properly done and that is why there is such a high level of coliform bacteria in the water.

How then did Indore get the Water Plus certification then? All the STPs were run at full capacity a fortnight prior to and during the visit of the Swachh Sarvekshan team so that the water was clean in the rivers!! Aqua harvesters were used to clean up the water hyacinth from the rivers as shown in the picture below. Once the evaluation was done and the team had left, the STPs were put back into the bypass mode and Indore became water minus again!!

Water Harvesters Cleaning up Water Hyacinth from the Rivers in Indore *(Photo by Rahul Banerjee)*

Thus, even after making huge investments in thousands of crores in tapping of outfalls and laying sewer lines and setting up STPs, due to a serious lack of financial resources, these investments are not yielding the desired results as the STPs are not being run properly and most of the wastewater is being released untreated into the rivers. The claims of reuse of water to the tune of 100 MLD are also false. Not only is the quantity of tertiary treated water much less but also enough lines have not been laid to carry this water to reuse points. Moreover, a new problem has emerged as a consequence of tapping all the outfalls into the rivers. During monsoons these outfalls used to discharge the stormwater into the rivers. However, sewer lines that have been laid to carry the flow from these outfalls have been designed only to carry the wastewater flow in the rest of the year and not the storm water in the monsoons. So, even small showers are resulting in waterlogging in the catchment areas of the outfalls and when it rains heavily, these areas remain severely waterlogged for days on end and become water plus in a different sense altogether!!

Therefore, instead of making false claims the IMC should abandon these costly centralised systems of waste water management and raise awareness about decentralised systems which are much less costly and can be done by the well-off individual households, commercial entities and government institutions which contribute 90 percent of the wastewater, on their own without burdening the IMC which can then be left to provide for the poorer households only.

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Note: *Earlier piece by the author on similar Indore claims in 2020: https://sandrp.in/2020/11/30/river-rejuvenation-in-indore-mendacity-displacing-common-sense/ (https://sandrp.in/2020/11/30/river-rejuvenation-in-indore-mendacity-displacing-common-sense/)*

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