



Water quality of Yamuna River due to discharge of open drains in Delhi

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Abstract

The Yamuna River is the second largest tributary of Ganges. It is originating from the Yamunotri Glacier at a Hight of 6,387 meters on the southwestern slopes of Banderpooch peaks of the lower Himalaya in Uttarakhand. It travels a total length of 1,376 kilometers. It is one of the most polluted river in India. Yamuna river flows only for 54 kilometers from Palla to Badarpur through Delhi, The 22 km stretch from Wazirabad to Okhla, Which is the less than 2 percent of the river length of 1370 kilometers from Yamunotri to Prayagraj, accounts of about 76 percent of the pollution level in the river. This 2 percent stretch from Wazirabad to Okhla have maximum discharge of untreated industrial and domestic waste. The undeveloped sewerage system and unavailability of sewerage lines in Delhi are affecting the water quality of Yamuna River by falling of untreated sewage water through the open drains. The 21 drains discharge around 850 MGD (million gallons per day) of sewage into the Yamuna every day. Looking to the severe condition of the sewerage system, it was decided to carry out a study to analyze the effect of open drainage system on water quality (Physico-chemical parameters) of Yamuna River.

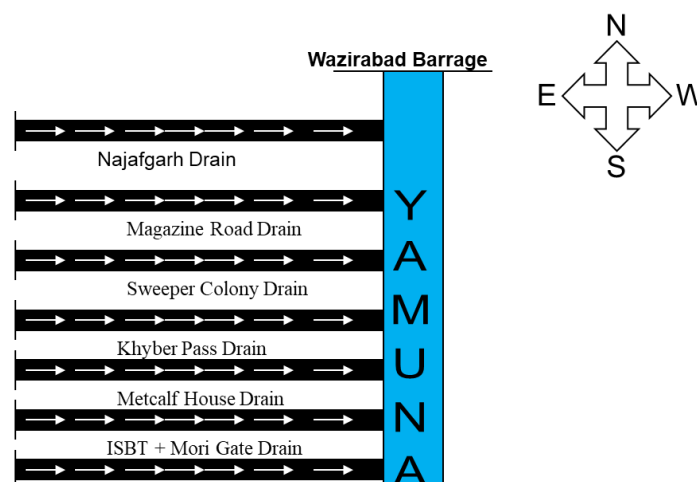
Keywords: Physico-chemical parameters, wastewater, Yamuna River, open drains

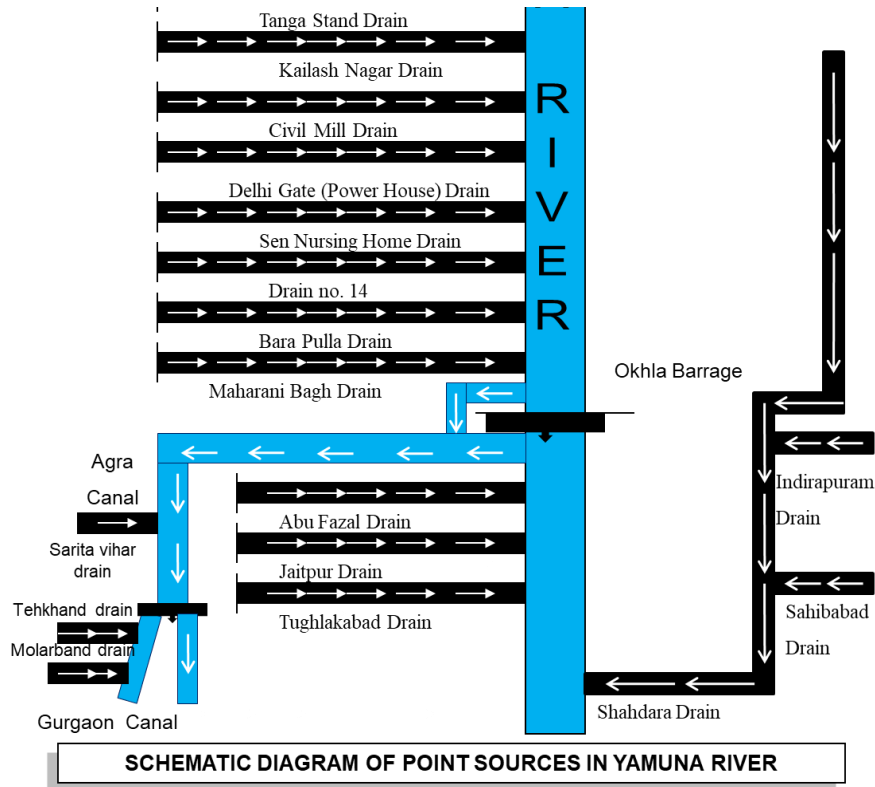
1. Introduction

The Yamuna river, which is the lifeline of Delhi, is one of the most-polluted river in the country. Discharge of untreated domestic and industrial waste water in the Yamuna river is the main cause of Yamuna river pollution. Yamuna river flows only for 54 kilometers from Palla to Badarpur through Delhi, the 22 km stretch from Wazirabad to Okhla, which is the less than 2 percent of the river length

of 1370 kilometers from Yamunotri to Prayagraj, accounts of about 76 percent of the pollution level in the river. This 2 percent stretch from Wazirabad to Okhla have maximum discharge of untreated industrial and domestic waste. The 21 drains discharge around 850 MGD (million gallons per day) of sewage into the Yamuna river every day. So the objective of this study is analysis of the parameters of waste water of the open drain in Delhi.

2. Schematic diagram showing point sources in Yamuna River (Wazirabad – Okhla Barrage)





3. Water QUALITY STATUS OF River Yamuna

WATER QUALITY STATUS OF RIVER YAMUNA						
Date of Sampling 17-11-2018						
S. No	Locations	pH	COD (mg/l)	BOD (mg/l)	DO (mg/l)	Total Coliform (MPN/100ml)
Water Quality Criteria ('C' Class)		6.0- 9.0	-	3(max)	4(min)	5000
1	Palla	8.2	4	1.2	6.8	-
2	Surghat (Down stream of Wazirabad Barrage)	7.8	12	3.6	6.2	-
3	KhajoriPaltoon Pool (Downstream Najafgarh Drain)	7.2	132	42	NIL	-
4	KudesiaGhat	7.6	92	31	3.6	-
5	ITO Bridge	7.4	104	2.2	NIL	-
6	Nizamudin Bridge	7.5	108	36	NIL	-
7	Agra Canal (Okhla)	7.6	60	20	NIL	-
8	After meeting Shahdara Drain (Downstream Okhla Barrage)	7.8	136	44	1.2	-
9	Agra Canal (Jaitpur)	7.6	64	22	NIL	-

4. Water quality status of Drain

WATER QUALITY STATUS OF DRAIN					
Date of Sampling 17-11-2018					
S. No	Name of Sample	pH	TSS (mg/l)	COD (mg/l)	BOD (mg/l)
	General Standard	5.5- 9.0	100	250	30
1	Najafgarh Drain	7.4	264	260	90
2	Metcalf House Drain	7.3	68	60	22
3	Khyber Pass Drain	7.4	212	128	42
4	Sweeper Colony Drain	7.6	124	36	11
5	Magazine Road Drain	7.1	432	244	80
6	ISBT Drain	7.4	204	148	50
7	Tonga Stand Drain	7.9	24	80	28
8	Moat Drain	NO FLOW	NO FLOW	NO FLOW	NO FLOW
9	Civil Mill Drain	7.4	112	108	32
10	Power House Drain	7.3	196	240	80
11	Sen Nursing Home Drain	7.3	320	360	120
12	Drain No. 12A	NO FLOW	NO FLOW	NO FLOW	NO FLOW
13	Drain No. 14	7.9	88	92	30
14	Barapulla Drain	7.4	118	128	43
15	Maharani Bagh Drain	7.1	732	360	120
16	Kalkaji Drain	NO FLOW	NO FLOW	NO FLOW	NO FLOW
17	SaritaVihar Drain (Mathura Road)	7.3	348	168	52
18	Tehkhand Drain	7.5	416	400	135
19	Tuglakabad Drain	7.5	472	424	140
20	Drain Near LPG Bottling Plant	NO FLOW	NO FLOW	NO FLOW	NO FLOW
21	Drain Near SaritaVihar Bridge	7.4	168	108	35
22	Shahdara Drain	7.3	436	344	115
23	Sahibabad Drain	7.3	456	544	180
24	Indrapuri Drain	7.3	212	336	110

5. Conclusion

The study of open drainage system and sewerage system of Delhi shows that there is lack of proper system for treatment and drainage of wastewater. It is very necessary to lay down sewer lines in the city as well as to connect the sewer lines with the sewerage system of the city so that the wastewater can be easily transported to the Sewage Treatment Plants (STP) for its treatment before discharge it into the Yamuna river.

6. References

1. Delhi Pollution Control Committee report.
2. Naveen Kumar, Dr. Mahendra Chaudhary. Effect on Water Quality of Chambal River due to Discharge of Open Drains in Kota City. 2017; 4(11).