

A Case Study of Selected Water Quality Parameters of River Ganga at Brijghat (J.P Nagar), India

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Abstract

Study of river water shows variations in selected water quality parameters. Values of parameters are fluctuating with changing locations. The main reason of changing water quality is industrialization and domestic sewage. Water sampling has been done at four different upstream and downstream sites. Untreated sewage of three villages adding at site IV of Ganga river, so water sample at site IV is not suitable for drinking purpose.

1. Introduction

Water is one of the most important natural resource on earth. Water is necessary for increasing demand of agriculture, industries and household use. Due to these increasing demand water quality is deteriorating, cremation of dead bodies, Industrial pollution, biomedical waste disposal, untreated sewage and disposed waste of temples polluting river water which harms not just humans, but the aquatic life also. Contaminated river water causing disease in humans such as cholera, diarrhea, dysentery, neurological disease and causing death in children.

2. Study Area

Four different sites along river Ganga at Brijghat are selected for the collection of water sampling. Gadawali – This village is located at the upstream, at the right bank river Ganga at Brijghat. Gadawali is about 5 km from the Brijghat. The sewage water of two villages Gadawali and Garh comes into river Ganga. Bakhtawarpur – This village is also located at the upstream, at the right bank of Ganga at Brijghat, distance of bakhtawarpur from

gadawali is about 3 km. The sewage which starts from bakhtawarpur goes down into the river. There is some waste and useless garbage are also directly throws from the nearby ghat of bakhtawarpur. Alamgirpur – This village is located on the right bank of river Ganga. During the festive days a congregation of pilgrims occurs and offers different types of offering to river Ganga and people takes holy dips at the main ghat of Brijghat. Various small ,sewage and canals which comes from Alamgirpur goes down into river Ganga. Pooth – This site is located at right bank of river about 8 km from main bridge of Brijghat. The sewage of simbhaoli sugar mill, Pooth and Nainpur village goes down into river water and makes it polluted.

3. Material and Methods

8L of water samples collected from four different sites. Sample collected in polythene bags and samples has been taken from the sites in the month of August and September (2017-2018) Transparency and temperature of water were recorded on the sites during sample collection. For

determining the BOD and DO, samples were fixed at the sampling site. Some other parameters like conductivity, turbidity, calcium, alkalinity etc were recorded in laboratory. Transparency recorded by using secchi disc, temperature by thermometer, pH by using pH meter, turbidity by turbidity meter, conductivity by electric conductivity meter, nitrate by ion selective

electrode method, Biological Oxygen Demand (BOD) by 5 days incubation method, Dissolved Oxygen (DO) by titration method, Total Dissolved Solids (TDS) by gravimetric method after filtration calcium (Ca²⁺) by EDTA titrimetric method. Chemical Oxygen Demand (COD) by dichromate titration method and total biomass.

4. Results and Discussion

Table 1.1

Sites	Temperature		Transparency		pH	
	2017	2018	2017	2018	2017	2018
Site A	27.9	28.3	22.4	21.4	8.28	8.41
Site B	28.1	29.1	22.8	22.6	8.19	7.88
Site C	27.8	28.7	25.6	22.6	8.19	7.91
Site D	28.0	28.2	24.6	20.2	8.51	8.00

Sites	TDS		Nitrate		Electrical Conductivity	
	2017	2018	2017	2018	2017	2018
Site A	109.20	104.58	2.30	3.13	538	584
Site B	111.90	109.49	2.40	2.52	510	580
Site C	112.56	115.51	3.10	2.11	478	551
Site D	112.23	113.58	2.20	1.51	492	548

Sites	Turbidity		Alkalinity		Calcium	
	2017	2018	2017	2018	2017	2018
Site A	368	443	238	234	18.0	23.6
Site B	324	365	220	216	20.8	25.7
Site C	338	408	218	216	28.9	29.1
Site D	339	387	228	230	28.1	31.7

Sites	D.O		B.O.D		C.O.D	
	2017	2018	2017	2018	2017	2018
Site A	3.9	4.7	32.6	25.5	45.0	60
Site B	4.1	5.2	31.8	22.4	51.1	68.5
Site C	3.8	5.1	33.1	22.9	51.7	68.5
Site D	4.8	5.5	24.6	20.1	58	56.1

Sites	Total Biomass		Depth	
	2017	2018	2017	2018
Site A	1.982	2.098	12	12.5
Site B	3.20	2.941	15	15.5
Site C	2.79	1.79	19	19.5
Site D	2.097	1.99	17	17.5

1. The temperature is the measuring unit of hotness or coldness of water.

2. Depth is the deepness of any water body from its surface.

3. pH measures acidic or basic the nature of river water.
4. Turbidity caused by clay organic and other suspended particles present in water bodies.
5. Conductivity means the ability of water to pass an electric current. Electric current will pass through it, if the ions and dissolved salts are present in water.
6. BOD is amount of dissolved oxygen that can be consumed by aerobic organisms, that break down the organic material present in a water sample.
7. DO is measured as amount of dissolved oxygen in water.
8. Amount of a specified oxidant reacts with water sample is known as its COD.
9. TDS is the amount of total dissolved solids of all the organic or inorganic substances present in water sample. These solid remains in water in suspended form.
10. Nitrates excess amount in water cause significant problems.
11. Transparency is a measure of the depth of light penetration into the water. Water transparency depends on the amount of particles in the water. Particles can be inorganic or organic.
12. Alkalinity is the ability of the water body to neutralize acids and bases.
13. Total biomass is composed of diverse species of micro and macro organisms in water.

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