



Chemical Analysis Regarding River Ganga (Known As Bhagirathi In Hindu Religion) In Haridwar District .

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Abstract –

The Ganga action plan was started in 1986 with the primary goal of reducing pollution and improving water quality by intercepting, diverting, and managing current hazardous and industrial chemical wastes from designated atrociously polluting unit's arriving to the river Ganga. The primary objective of the action plan was to stick with these tactics over the long term. The success of the initiative is in doubt since, despite repeated assertions of thorough study and public awareness, there has been no noticeable change in the quality of the water. To assess the levels of physicochemical variables and polycyclic aromatic hydrocarbons in the Ganga mainly in Haridwar district, the study is underway and measure the physico – chemical and ionic concentration .

Index terms – Introduction , abbreviation and acronyms , population and sample , data and sources of data , statistical tools and econometric models , results and discussion , acknowledgement and references .

INTRODUCTION –

Physical and chemical factors operate both individually and collectively, and their interaction creates a biotic environment that, in turn, affects the development, expansion, and eventually succession of biotic communities. The tributaries of the River Ganga in India pass through states of U.P., M.P., W.B., Jharkhand, Rajasthan, Uttarakhand, and Bihar. The primary cause of water pollution is human activity, which includes sewage effluent discharges, household wastewater, toxic metals and metal chelates from various sources, as well as the indiscriminate use of pesticides and fertilisers in agriculture that include heavy metals. The species diversity, abundance, productivity, and physiological state of aquatic ecosystems are all impacted by the quantity of pollution in the water. Rivers plays significant role in distribution and transportation of materials. The accumulation of these substances makes water hazardous for use by humans and aquatic life. Water assessment is required to protect and improve water quality. Human activities cause POPs (persistent organic pollutants) to enter water bodies, including PCBs (polychlorinated biphenyls), PAHs (polycyclic aromatic hydrocarbons), phenols, and pesticides with various toxicological, physical, and chemical, characteristics

(Tarek and Mohamed 2006). Based on prevalence and toxicity, many of these contaminants are undesirable for the flora and fauna.

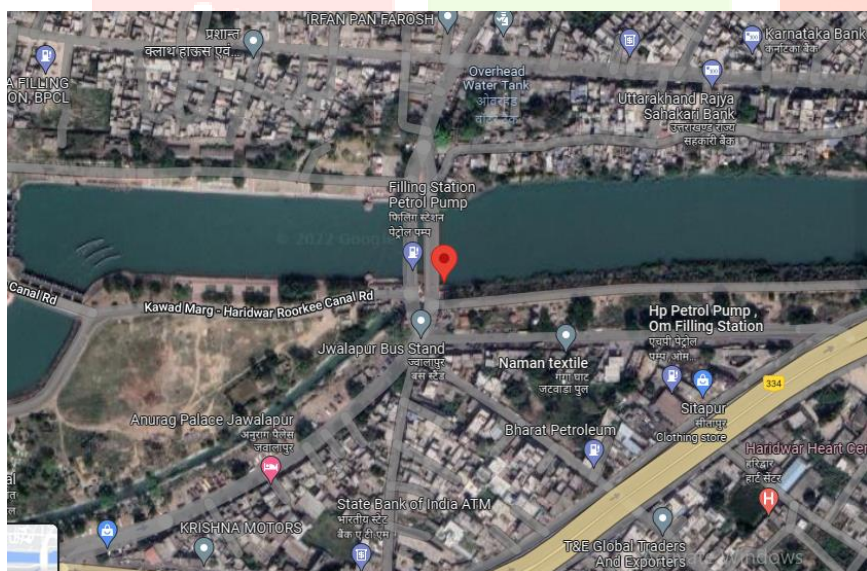
Depending on the compound's vapor pressure, these microorganic pollutants may exist in two different states under atmospheric conditions: gaseous and bonded to atmospheric particles. There are more than 100 distinct PAHs. They can endure long distances because of a mixture of their physicochemical traits, which include high octanol-water partition coefficient (Kow), low water solubility, moderate vapor pressure, and persistence in the atmosphere.

Abbreviations and Acronyms– Toxicity , PAHs ,solubility , aquatic , pesticides and fertilizers , river , ganga , SPSS , ANOVA , Physico chemical and ionic concentration etc

RESEARCH METHODOLOGY –

Estimating the quality of water parameter and calibrating the device were done carefully and according to the rules (APHA,1995). By taking the necessary procedures, potential contamination from beakers, containers, flasks, etc., was avoided. The technique depends on the available laboratory facilities, how simple it is to use, and how little other parameter interference will cause if there are many ways available for a given parameter. All solutions were created using double-distilled deionized water and analytical grade chemicals (or comparable grade reagents) from (Aldrich, Sigma or E. Mark). Throughout this production, Borosil glass products were utilized.

Population and sample –



In this study, water samples were collected in an integrated manner. Grab sampling was used to gather several samples from the area around the sampling location, which was then combined. As feasible, samples for each set were taken from the same spot on the site. Using polyethylene bottles and funnels (diameter 14 cm) clamped to stands 1 meter high to prevent contamination by splashes. 10 such samples are brought to analyse in order to get fruitful data. The sampling program considered several variables, including the frequency of sample collection, overall sample count, sample collecting locations, sample size based on the amount of data to be gathered, and transportation.

Data and sources of data –

The data of 10 samples studied during the monsoon season and it is compared with Bhutiani, R., Khanna, D. R., Kulkarni, D. B., & Ruhela, M. (2016). Assessment of Ganga river ecosystem at Haridwar, Uttarakhand, India with reference to water quality indices. *Applied Water Science*, 6(2), 107-113.

Statistical tools and econometric models-

Utilizing statistical software, especially the Statistical Package for the Social Sciences, statistical analysis was carried out (SPSS). Physical and chemical parameters were compared using analysis of variance (ANOVA), and Pearson's correlation coefficients analyzed relationships between PAH occurrences. A t-test was used to compare the two rivers' mean PAH, physicochemical concentrations, and characteristics.

RESULTS AND DISCUSSION –

The maximum pH and temperature found to be 8.82 and 45.75C , Hardness of water is in between the range 101 – 191.75 mg/l , Conductance found is 260 – 620.1mhos/cm , Turbidity is found in between 3.9 – 7.38 NTU , Total solids is found in the range 198.44 - 444.8mg/l and total dissolved solids is in range 206.68 -611.51mg/l. The fluoride ion concentration is in between the range 0.12 – 0.648mg/l , nitrate ion concentration is 24.759 – 36.55 mg/l , iron concentration is 0.169 – 1.6 mg/l , calcium ion concentration is in between 26.34 – 39 mg/l , Magnesium ion concentration is in between 10.24 – 19.62mg/l and maximum value of sulphate ion concentration is found to be 35.745 .

Analysis-

Physico – chemical parameters .

Noof sample	pH	Temp (Celsius)	Hardness (mg/l)	Conductance (mhos/cm)	Turbidity (NTU)	Total solids (mg/l)	Total dissolved solids (mg/l)
1	8.01	31.5	172.8	620.111	4.9	328.22	409.325
2	6.05	45.75	169.91	395.04	7.38	380.59	387.18
3	7.465	32.5	191.75	402.18	5.09	415.27	509.7
4	7.25	42.25	155.382	399.32	5.02	444.8	430.74
5	7.01	40.5	101.20	389.91	6.80	389.37	402.91
6	8.82	41.0	175.39	340.92	5.19	333.50	340.21
7	6.9	37.85	138.77	402.22	3.9	198.44	206.68
8	8.32	41.5	115.7	260.70	4.88	372.36	611.51
9	8.47	43.5	111.69	329.356	6.0	400.64	509.25
10	7.2	38.5	128.08	381.25	6.4	381.11	444.94

Ionic concentration-

No of sample	Fluoride (mg/l)	Nitrate (mg/l)	Iron (mg/l)	Calcium (mg/l)	Magnesium (mg/l)	Sulphate (mg/l)	
1	0.145	25.56	0.255	32.066	15.689	27.2589	
2	0.379	26.769	0.414	26.59	14.333	35.745	
3	0.269	31.40	0.242	31.9	13.42	29.4635	
4	0.3725	32.588	0.529	32.875	10.24	23.185	
5	0.426	30.522	1.335	28.36	12.65	27.106	6
6	0.255	24.759	0.169	39.075	19.62	33.659	
7	0.35	31.55	1.335	37.8	13.39	31.809	
8	0.12	25.750	0.399	26.99	17.78	34.75	
9	0.648	36.55	1.60	26.34	14.8	29.338	
10	0.488	33.95	0.625	33.54	11.68	19.568	

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