ANALYSIS OF PHYSIOLOGICAL AND CHEMICAL PARAMETERS TO EVALUATE THE WATER QUALITY OF PREMPURA GHAT AND KALIYA SOT DAM OF NEAR BY AREA BHOPAL

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ABSTRACT:- The present study deals with the investigation of suspected parts of Prempura Ghat And Kaliyasot Dam to ensure the water quality. In this regard due to discharge of harmful substances water quality have been changed to a considerable extent. At three different sampling station physiological and chemical characteristics like dissolved oxygen, chloride, phosphates, etc. were studied and analyzed using standard procedures. A through study was done on the basis of prevailing seasons. Domestic wastes, industrial effluents from security paper mill (SPM), agriculture run off, municipal sewage, etc. raised the physiological and chemical parameters which indicate the deterioration in water quality. The result of present study indicate that physic-chemical parameter of betwa river are below or within WHO limits.

KEYWORD:- Betwa river, Prempura Ghat And Kaliyasot Dam ,water pollution , physic-chemical parameters, water quality.

INTRODUCTION:- Water is a universal solvent and is one of the prime need of life. Since time immemorial fresh water has always been of vital importance for man, as his early habituation with in easy reach of tank , rivers, ponds, lakes, dams, etc. Due to industrialization and increase in population in demand of fresh water increases in the last decades. River pollution is the goal problem. For human life and agriculture purpose this demand of water is fulfilled by the river. The river water quality is deteriorated due to industrial as well as human activities. Water quality indices can be determined by various physicochemical parameters.

Kaliasot Dame:- Kaliyasot river is one of the main tourist attractions of Bhopal and one of the most charming tourist places of Bhopal, it is located in Lalbhati and Nehrunagar resident colony in the heart of Bhopal. Kaliasot Dame is used for irrigation in the Rabi crops between November and February, in the state of Madhya Pradesh, in Bhopal and Raisen districts about 10425 hectares. This Dame has been constructed very well in connection with the water conservation of Bhopal under which the rain water in Bhopal is fully concretized and the water of rain is fully utilized in irrigation. As it is known, a big palace called Bhopal's glory, which was built in the middle of 1005 to 1055 Parmar King Bhoj. Rain water comes from the Kolans river in this pond but in order to prevent excess water from rain water, Bhadbhada Dham was constructed in the south direction of Bhopal in 1965 and in it the overflow water was made in the KaliaSat Jalab in the year 1994. Is supplied which is stopped by the celestial water tank. There is also 13 gateways in this reservoir through which rain water is silted in the Kaliasot river which is found in the Betwa river . Rainfall caused more in Bhopal is regulated by KaliaSource Water Tank.

Prempura is a village in the Bhopal district of Madhya Pradesh, India. It is located in the Huzur tehsil and the Phandablock. It is situated near Dobra, around 8 km from the Raja Bhoj Airport. According to the 2011 census of India, Prempura has 3 households. The effective literacy rate (i.e. the literacy rate of population excluding children aged 6 and below) is 36.36%.

Betwa river is also known as **VETRAVATI** in Sanskrit. It is the river in NORTHERN INDIA, flows through Madhya Pradesh and Uttar Pradesh. It is tributary of the yumana. The Betwa rises in the Vindhya range just north of hoshangabad in Madhya Pradesh and flow north east through Madhya Pradesh and Orchha to Uttar Pradesh . Betwa river originates near Bhopal and meets Yamuna near Hamirpur. Total basin area in Madhya Pradesh is 19365 km². Total length of river is 575 km, out of which 216 km lies in Madhya Pradesh, 98 km common boundary between the two states and 261 km in Uttar Pradesh. Betwa river has 7 major tributaries. The major tributaries are, Kaliasote ghat , Prempura ghat , Bah River, Sagar River, Budhna River, Jamni River, Bina River.

Huge quantity of municipal sewage , domestic waste, SPM Cheaper mode of waste disposal dumped on daily basis in BETWA RIVER. During GANESH VISARGEN in September , and Diwali in December most heavy metals seeps into the betwa river. With the help of various physicochemical parameter betwa river water quality were studied.

MATERIAL AND METHOD :- The water samples were collected from the Prempura Ghat And Kaliyasot Dam and then sample are collected for quality estimation for various parameters, such as DO(dissolved oxygen), chloride, nitrate, phosphate. Titration method is used for estimation of the different parameters, parameters helps us to study the quality of water from different situations. Water from two sampling point SP1 (Kaliasote River), SP2 (Prempura ghat). The river water samples were collected in different sampling bottles as per standard method APHA2 . The pH, electrical conductivity and turbidity were estimated at sampling sites. The other parameters were measured by the procedure given by APHA in the laboratory.

Result and Discussion

Dissolved oxygen- It is the amount of oxygen dissolved in water or The dissolved oxygen (DO) is oxygen that is dissolved in water. The oxygen dissolves by diffusion from the surrounding air; aeration of water that has tumbled over falls and rapids; and as a waste product of photosynthesis. Photosynthesis (in the presence of light and chlorophyll):

Carbon dioxide + Water ----------> Oxygen + Carbon-rich foods

CO_2 H_2O O_2 $C_6H_{12}O_6$

With the help of DO test we measure the current oxygen level in the water. Variation arises in DO level with the temperature. At Kaliasote River, Prempura ghat DO level is high and at Kaliasote River DO level is low. In present study the value of DO level at sampling point 1 is 11.5mg/l, at station 2 is 11.0mg/l, and at station 3 it's 10.5mg/l . Chloride content- At those places where sewage water is more, the chloride content is higher. In present study the value of chloride content at station 1 is 10.1mg/l, at station 2 is 12.0mg/l, and at station 3 is 13.2mg/l . Nitrate- In the present study the value of nitrate content at station 1 is 0.073mg/l, at station 2 is 0.083mg/l, and at station 3 is 0.092mg/l . Phosphate- Phosphorous level rises in water due to the increased application of fertilisers, use of detergents, and domestic sewage. In the present study the value of phosphate content at station 1 is 0.14mg/l, at station 2 is 0.17mg/l, and at station 3 is 0.19mg/l.

Table 1:- Value of Dissolve Oxygen in mg/l at different stations:-

TESTING MONTH	sampling point SP1 (MG/L)	sampling point SP2 (MG/L)	MEDIAN (MG/L)
SEPTEMBER (PRE GANESH VISARGAN)	7	6.6	6.8
SEPTEMBER (AFTER GANESH VISARGAN)	6.9	6.8	6.85
OCTOBER (PRE DURGA VISARGAN)	8.1	8.0	8.05
OCTOBER (AFTER DURGA VISARGAN)	7.6	7.9	7.75

Table 2:- Value of chloride in mg/l at different stations:-

TESTING DATE	sampling point SP1 (MG/L)	sampling point SP2 (MG/L)	MEDIAN (MG/L)
SEPTEMBER (PRE GANESH VISARGAN)	10.2	11.1	10.65
SEPTEMBER (AFTER GANESH VISARGAN)	9.8	11.6	10.7
OCTOBER (PRE DURGA VISARGAN)	9.4	12.1	10.75
OCTOBER (AFTER DURGA VISARGAN)	10.1	12.0	11.05

Table 3:- Value of nitrate in mg/l at different stations:-

TESTING DATE	sampling point SP1 (MG/L)	sampling point SP2(MG/L)	MEDIAN (MG/L)
SEPTEMBER (PRE GANESH VISARGAN)	0.0075	0.0084	0.00795
SEPTEMBER (AFTER GANESH VISARGAN)	0.0074	0.0082	0.0078
OCTOBER (PRE DURGA VISARGAN)	0.0087	0.0091	0.0089
OCTOBER (AFTER DURGA VISARGAN)	0.0086	0.0090	0.0088

Table 4:- Value of phosphate in mg/l at different stations:-

TESTING DATE	sampling point SP1 (MG/L)	sampling point SP2(MG/L)	MEDIAN (MG/L)
SEPTEMBER (PRE GANESH VISARGAN)	0.16	0.18	0.17
SEPTEMBER (AFTER GANESH VISARGAN)	0.18	0.19	0.185
OCTOBER (PRE DURGA VISARGAN)	0.19	0.19	0.19
OCTOBER (AFTER DURGA VISARGAN)	0.19	0.20	0.195

CONCLUSION:- Different physico-chemical parameters are considered for water quality determination of BETWA river at 3 stations using 4 parameters as- DO, Chloride, Nitrate, & Phosphate. The present study was concluded that the water quality of BETWA river is suitable for human consumption in specific seasons, but during rainy season the water quality is deteriorating containing some heavy metals too. It was also studied that the physico-chemical characteristics of a few of the river samples during September - October crossed the maximum permissible limit, due to heavy mixing of effluents.

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