Evaluation of the Son River's water quality, with particular emphasis on BOD and COD, in the Shahdol area, MP (INDIA)

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ABSTACT
Since life cannot exist without water, river water is used for a variety of purposes, including irrigation and home consumption. In India, there are several factors contributing to river water pollution, including sewage discharge, human activity, illegal mining, urbanisation, and industrial waste. As a result, it's important to monitor the river's water quality via analysis.
In the current study, water samples from the Son river in Shahdol area (MP) were taken from two distinct places and evaluated for BOD and COD before and after the monsoon.
These parameters, BOD and COD, have been found to have greater values throughout the summer, and lower values during the wet season. The examination of these crucial parameters demonstrates high pollution load on the river water. So to maintain the quality of river water some preventive measures, monitoring of water quality and proper management is needed.
Key Words: BOD, COD, Son River, Quality of water.

INTRODUCTION

Three essential resources are necessary for human survival on Earth: water, air, and soil. Of these three, water is the most important since it is essential for all living forms, from bacteria to humans. 1.
In addition to their uses in agriculture, rivers are the primary sources of drinking water. The pollution of this natural resource is caused by an increase in human population, domestic waste, the careless disposal of sewage, industrialization, and the use of fertilisers, pesticides, and herbicides. The quality of the water can also change depending on the season and the location due to various agricultural, domestic, and sociocultural factors.[2-3]
Son River is the second largest of the Ganges' southern tributaries after Yamuna River. It originates in the *Amarkantak* hills of *Maikal range* at an elevation of 1030 m in Madhya Pradesh. After its origin it flows north–northwest through Shahdol district Madhya Pradesh, then it turns sharply eastward and encounters the southwest–northeast *Kaimur Range*, and it flows in the east– northeast direction, and parallels to the Kaimur range through Uttar Pradesh, Jharkhand and Bihar states and debouches in the river Ganga near Patna city of Bihar. The total length of the river is 784 km, out of which about 500 km lies in MP, 82 km in Uttar Pradesh and the remaining 202 km in Bihar, the total catchment area of the river is spread over,71,259 sq km[4-5]

Aim of the study

Son river water is the key source for domestic and irrigation purpose in the nearby villages of study area, so it is very necessary to evaluate the water quality in the study area. **BOD** is an important parameter required, to study water pollution, the higher **BOD** value of any water body, more the water polluted by the organic pollutants. **COD**, defined as amount of oxygen required for oxidation of both organic and inorganic pollutants and hence **COD** for a particular water sample is higher than the **BOD**. It measures the degree of water pollution and self purification capacity of the river[6].
In the present study, water sample of Son river from two different site, *Diyapiper* (SS-1) and *Ksheersagar* (SS-2) near Shahdol has been assessed for BOD and COD, during pre monsoon (March-Apr-May 2019) and post monsoon (Oct-Nov-Dec.19).

MATERIALS AND METHOD

The present study carried out in the year 2019, before (pre) and after (post) monsoon season in Shahdol (MP). The water samples were collected from two locations, *Diyapiper* (SS-1) and *Ksheersagar* (SS-2). Diyapiper is situated around 16.5 km from the city, and Ksheersagar is situated around 22.5 km from city, in this location river *Mudna* meet with Son river, Collection, preservation, and transportation of water samples to the laboratory were as per standard methods[7]. BOD analyzed using BOD incubator; and COD measured using Open Reflux Method.

RESULT AND DISCUSSION

The results of study have been reported in table -1 and in table -2, the results denotes that the allvalues were increased in pre monsoon season as compared to post monsoon season.

BOD (Biological Oxygen Demand) – It is the measure of oxygen required by the micro-organism for biological oxidation of organic matter. Actually amount of oxygen required to carry out biological decomposition solids in sewage under aerobic condition at standard temperature is known as BOD. The test for BOD is very useful in rivers pollution control management it serve as a measure to assess the quality of water, while COD (Chemical oxygen Demand) defined as amount of oxygen required for oxidation of both organic and inorganic pollutants and hence COD for a particular water sample is higher than the BOD.

Both these parameters are recorded maximum in pre monsoon season in site, S.S.-1 and S.S.-2, may be due high pollution load, here at site *Ksheersagar* we observe one notable fact, *Tanki Nalla*, main 3 sewer drains of Shahdol city, meets into *Mudna river*, which then meets intoriver Son at *Ksheersagar* (S.S-2), after monsoon the BOD and COD values are less may be due to dilution by rain water in comparison to summers. Present studies are in agreement with earlier studies, reported by Saini D. et.Al.[6] and Maya K.et. Al.[8]

TABLE – 1 [Data of Biological oxygen Demand (mg / l)]

S.N.	S.S	March	April	May	Mean	Oct.	Nov.	Dec.	Mean
1	1	13.5	15.8	19.5	16.2	9	11	14.4	11.4
2	2	20.2	25	32.4	25.8	8.4	13.6	16.5	12.8

TABLE – 2 [Data of Chemical oxygen Demand (mg / l)]

S.N.	S.S.	March	April	May	Mean	Oct.	Nov.	Dec.	Mean
1	1	67.4	71.8	73.5	70.9	53	57.4	61.5	57.3
2	2	71.8	80.5	89.3	80.5	59	61.5	67	62.5

CONCLUSION

We draw the conclusion that water should be treated before being used for home purposes based on the data of BOD and COD of collected water samples from the research region. It is strongly advised that state government authorities take the necessary steps to clean up the Son River with the aid of some NGO's.

REFERENCES

1 Mohd. J. A., Mohd. I. (2017), Study on yearly variation of physico-chemical parameters of Sone river water at Koilwar site in Bihar, India, International Journal of Chemical Studies **5(3)**:504-509

2 Barai, S.R. Kumar Satish, (2012), Evaluation of the physico-chemical characteristics of River Varuna at Varanasi, India, Journ of Envoron. Biol. **34**, 259-265

3 Chaurasia S., Karan Raj. (2013),Water quality and pollution head of River Mandakini atChitrakoot India, Int. Res. J. Environ. Sci. **2(6)**, 13-19

4 Joshi K.D., Jha D.N., Alam A., Srivastava S.K., Kumar V. and Sharma A.P. (2014) Environmental flow requirements of river Sone: impacts of low discharge on fisheries, CurrentScience, **107(3)**, 478-488

5 Chinmaya M., Gautam S.K., Singh A.K. and Tripathi J.K. (2015), Major ion chemistry of the Son River, India: Weathering processes, dissolved fluxes and water quality assessment, J. Earth Syst. Sci.(Indian Academy of Sciences**)**, **124(6)**, 1293–1309

6 Saini D., Dubey K.K. (2018), To study the water quality status of river Narmada with specialreference to B.O.D. and C.O.D. at Jabalpur region in M.P., India, Int. Jour. of Research and Analytical Reviews**, 5(4)**, 194-197

7 APHA, Standard methods for examination for water and wastewater , American Public Health Association, Washington DC, New York, 1998, **20th Edn.**

8 Maya, K., Babu, K.N., Pabdmalal, D. and Seralathan, P. (2007) Hydrochemistry and dissolved nutrient flux of two small catchment rivers, south western India, Journal of ChemicalEcology, **23(1),** 13-27.