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Study of Contaminants Index of Musi River Command Area

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ABSTRACT

The cause of this study is to investigate the broad Contaminants Index (CCI) of the study area vicinity with a view to investigate the water pollution level of the four hundred-year-antique Musi River located in Hyderabad Telangana. The study is done in view of sustainable development. Water samples had been gathered from villages, which might be 15 km away from each other as a consequence, a complete of 60 km downstream villages belt were considered to examine the contaminants index. A composite sampling technique is used to collect samples from sampling locations following a standard way to obtain a representative samples. There were total 9 physiochemical properties hadbeen analyzed and the facts had been seen in comparison with (WHO) and BIS standards. The complete pollution index values for the four sampling sites are 2.0, 1.61, 1.4 and 1.thirteen, respectively, indicating that the pollution in the direction of the downstream is reducing but, those areas are considered as medium polluted due to the fact these values fall into category four consistent with the CPI score. At the start of the have a look at place, CPI suggests excessive eutrophication hazard. This look at can be an alternative for determining the level of pollution, indicating pollutants, and decision making of the use of water.

KEY WORDS: CPI, MUSIRIVER, DOWNSTREAM, AND POLLUTION.

INTRODUCTION

Water is a vital commodity, both to sustain life and for the global economy. However, the quality of global water has rapidly declined for decades due to the impact of both natural and anthropogenic factors (Vadde et al. 2018). Assessing water quality for different water use purposes, such as domestic use, irrigation, conservation and industrial usage, are an important strategy for food safety and human health. Water quality evaluation aims to identify the sources of water pollution and develop a strategy for sustainable water source management, maintaining and promoting human health and other social and economic growth (Carroll et al. 2006). Surface water quality indexes have been developed and introduced worldwide by researchers with various applications of the Nation Sanitation Foundation Water Quality Index (NSFWQI) (Carroll et al. 2006), the Water Quality Index (WQI) (Gupta et al. 2003). The Comprehensive Pollution Index (CPI) (Matta et al. 2017).

2.0 Study Area

MATERIAL AND METHODS

Actual samples collected in the bottles and filled to the surface until overflow after sampling, nitric acid (1.0 mg/L) was added to all the samples as a preservative.The water sample were tested for their physical-chemical properties. All parameters had been dissected by standardized techniques, Ph, TDS,, Alkalinity, TotalHardness, Ca,

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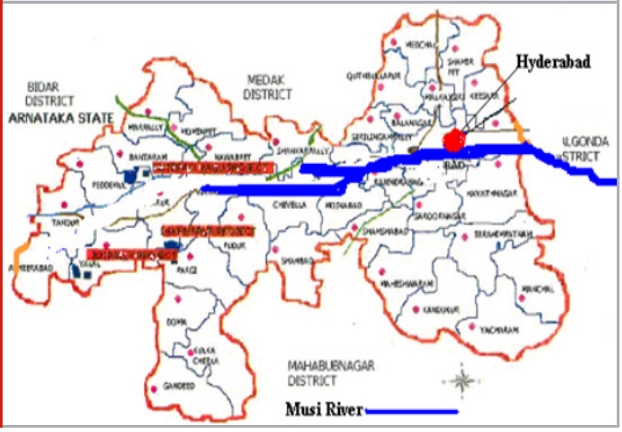
Nitrate,BOD, COD and Ammoniacal Nin order to test the standard methodologies recommended by APHA was used.

Figure 1: Study area location



RESULTS AND DISCUSSION

The CPI is used to access the level of pollution in a specific river by using monitoring statistics (Liu & Zhu 1999). The formula to calculate CPI is presented as follows: The interpretation of results are subjected to statistical analysis using comprehensive pollution index equationCPI = 1/ n summation of Pli. Where CPI =Comprehensive Polluted Index; n = number of monitoring parameters; Pli =the pollution index number i. Pli is calculated according to the following equation: Pli = Ci /Si where Ci = measured concentration of parameter number in water; Si = permitted limitation of parameter number according to environmental standard.

CPI is classified into five categories: 1. Category 1: CPI from 0 to 0.20 (clean); 2. Category 2: CPI from 0.21 to 0.40 (sub clean); 3. Category 3: CPI from 0.41 to 1.00 (slightly polluted); 4. Category 4: CPI from 1.01–2.00 (medium polluted); 5. Category 5: CPI more than 2.01 (heavily polluted).

Table 1. Physico-Chemicalparameters Musi Rivercommand Area

Parameters	Pratapasingaram	Enkriyal	Surapally	Aroor	Water quality Standards
Ph	8.9	8.2	7.9	7.3	7
TDS	4080	860	780	750	500
Alkalinity	372	216	143	123	200
TH	368	352	338	326	100
Ca	190	186	182	175	75
Nitrate	91	87	81	73	45
B.O.D	43	36	24	5	30
COD	266	253	210	67	250
Ammoniacal N	1.55	1.27	1.12	0	1.2

Table 2. Comprehensive pollution analysis

Parameters	PliPratapasingaram	PliEnkriyala	PliSurapally	Pli (Aroor)
Ph	1.3	1.2	1.1	1.0
TDS	8.2	1.7	1.6	1.5
Alkalinity	1.9	1.1	0.7	0.6
TH	3.7	3.5	3.4	3.3
Ca	2.5	2.5	2.4	2.3
Nitrate	2.0	1.9	1.8	1.6
B.O.D	1.4	1.2	0.8	0.2
COD	1.1	1.0	0.8	0.3
Ammoniacal N	1.3	1.1	0.9	0.0
Sum of Pli	23.3	15.2	13.6	10.8
CPI	2.59	1.69	1.51	1.20

According to the CPI's classification, this river was under heavily pollutedcatgory this may be because of the dump of solid waste, untreated intrusion of industrial effluent and also untreated sewage water intrusion. The CPIs were different among the monitoring points upstream, midstream and downstream. Now the government has taken very good action to clean the river water but the best recommendation here is to prevent the intrusion of waste into it.

CONCLUSION

Understanding the water quality is very important, it is concluded that CPI indicates a high eutrophication risk. This study may be an option for determining the current state of water quality, indicating pollution, and making water use decisions.

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