

SOME ASPECT OF ASSESSMENT OF WATER QUALITY OF KOSHI RIVER OF MADHEPURA, BIHAR.

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ABSTRACT:

This paper presents the results of characteristics during one year across five sampling stations located at the banks of Koshi River at Madhepura. The water quality parameters like TDS, DO, BOD, COD, TH, chloride, sulphate, calcium, Magnesium, iron and pH were studied by various analytical techniques. It was observed that most of the water quality parameters are in the acceptable limits according to WHO standards. The present investigation revealed that a few of the water sample of Koshi River zone are not fit for domestic use and need proper treatment before use.

Keywords :

Water quality, Parameters, Characteristics, standard limits, TH, COD, BOD, TDS.

INTRODUCTION:

Koshi River is the third largest Himalayan River after the Indus and Brahmaputra. The Koshi is named "Sapta Koshi" and also said to be Bihar ka shok "sorrow of Bihar" as annual flood effect about twenty one thousand square of Agricultural and thereby disturbing the rural economy. The district is regularly visited by the flood water of Koshi River which possess a process significant drainage during monsoon. The Koshi River has found a megafan of the 13,000 km² in Bihar state. The Madhepura is situated at the South-Eastern parts of the megafan. Water is one of the vital ingredient of human life. God has carished us intellect, courage and scientific attitude, hence we should utilise water properly for the shake of humanity. The water quality is degraded gradually due to population growth, industrial proliferation, urbanization, increasing living standards and wide sphere of human activities. The present investigation is a modest attempt to determine the probability of drinking water used by the people residing in Madhepura between the banks of the Koshi River.

WATER USE HABITS:

The ground water level remains usually shallow and the people of the district depends on ground water for their domestic and to a great extent for the irrigation need. Earlier, dug wells are usually used as the main ground water abstraction, however, now a days shallow tube Wells (STW) with the hand pump fitted are the popular ground water abstraction structure in the region.

LOCATION OF SAMPLING POINTS:

For monitoring the chemical characteristics of Koshi River at Madhepura about five sampling stations were selected as blocks and they were represented as S₁, S₂, S₃, S₄ and S₅ respectively. The blocks are usually Singheshwar, Ghamaria, Ghelardh, Kumarkhand Shankarpur. The distance between the two successive sampling stations were located nearby 5 to 10 km apart.

MATERIAL AND METHODS:

Water samples were collected from various zones/ places once in a month for a time log of one year between 9 A.M. to 11 A.M. To determine the BOD according to the standard method samples were insubated at the temperature range of 22°C to 25°C, COD, TH, Chloride and Sulphate, Calcium,

Magnesium, and iron were analysed by standard method prescribed by APHA¹². DO, TDS and PH values were determined by VSI-06 water analyser kit.

COLLECTION OF WATER SAMPLES :

The samples of groundwater from handpump were collected in plastic Cans of three litres capacity as per standard procedure for water samples from a sampling point situated at different zones were collected the samples were kept in refrigerator maintained at 4°C. The sampling zones and source of ground water are given in table:

Table-1

Sl. No.	Different zones(Blocks)	Sample no.	Source of sample
1	Singheshwar	S ₁	Handpump
2	Gamharia	S ₂	Handpump
3	Ghelardh	S ₃	Handpump
4	Kumarkhand	S ₄	Handpump
5	Shankarpur	S ₅	Handpump

RESULT AND DISCUSSION :

In the present investigation DO range of dissolved oxygen over a period one year was found to be high as shown in the table-2 given below. However, the DO content was found to be low during the summer season at all the five stations

BOD measures the amount of oxygen used by micro-organisms during aerobic decomposition of organic pollutant, which is comparatively low for the river water indicating it to be less polluted, however there are some fluctuations in the BOD level. This may be due to faecal pollution and discharge of domestic waste in the river.

The COD values were also to be within the permissible level set by WHO of 10 mg/l. The COD is linked with heavy pollution from Industries, domestic sewage industrial effluents on the bank of river. TDS and TH values of river water were also found within the permissible standard limits set by WHO. The pH values were also found within the desirable limits prescribed by WHO¹³ and ISI¹⁴.

In the present study from 90 to 190 mg/l which was future according to WHO and ISI-10500-91 prescribed limit.

The most important source of chloride in the water is the discharge of domestic sewage. In the present analysis chloride concentration was found in the range of 39 to 60 mg/l. This value was within the limit according to CPHEEO. At high concentration Magnesium Salts have a laxative effect particularly. When present as Magnesium Sulphate. Magnesium content in the investigated water sample were varied from 21.5gm/l to 29gm/l which was within the permissible limit. In the present investigation, calcium concentration ranged from 35.1gm/l to 42gm/l and all samples showed normal limit. The analytical result of various hand pumps have been shown in table 2.

Table 2

Physicochemical analysis of parameter of drinking water of the Madhepura district:

Sl. No.	Parameter	S ₁	S ₂	S ₃	S ₄	S ₅	PL(WHO)
1	DO	6.3	7.0	7.1	6.5	7.5	4.0-6.0
2	BOD	2.6	3.0	2.3	3.1	2.7	10
3	COD	8.4	9.0	9.1	9.3	9.2	10
4	TDS	220	190	170	210	290	500

5	TH	90	180	100	160	190	300
6	Cloride	50	55	45	60	39	200
7	Sulphate	15	13	10	16	15	250
8	Calcium	42.1	38.2	41.5	40.5	35.9	75
9	Magnessium	25.2	29.0	21.5	28.6	30.0	<30
10	Iron	2.1	1.7	7.0	8.6	9.5	<0.3
11	PH	7.4	7.6	7.2	7.1	7.3	6.5-8.5

CONCLUSION:

The current study indicates that water quality of Koshi River along Madhepura district is in permissible limits due to high level of DO. Similarly, after parameters were found within WHO limits and water from sampling points was fit for drinking purpose and house-hold uses. The water quality is usually safe, however, contamination of higher concentration of iron is observed which need to be mitigated for benefit of people. Finally, regarding the pollution status of the Koshi River water require the assessment of heavy metals pollution which is in progress.

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