

## Metallic Status in and around *Chopan* River Raghogarh

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### ABSTRACT

Assessment of metals in ground water and surface water of different stations in and around Chopan river of Raghogarh, Madhya Pradesh has been carried out in the year (2004).

The present work was conducted to evaluate four metals *i.e.* Copper, Iron, Zinc and Lead from four tube wells and six stations at Chopan river. It was found that the values of Iron metal were higher at some stations particularly near the study area *i.e.* Fertilizer industry.

**Key words:** Metallic status, Chopan river, Raghogarh.

### INTRODUCTION

Heavy metals are those having a density more than five times higher than that of water. These metals are now a day the environmental pollutants of major concern<sup>1</sup>, and is due to the basic fact that metals are not biodegradable or perishable. Metals are released into environment by anthropogenic activities, such as burning of fossil fuels, discharge of industrial effluents, mining and such other action leads to the development of its toxicity in water.

This unfavourable alteration in the surrounding generate pollutants, which can cause various problems like itai-itai disease, anaemia etc.

In the present study a spectrophotometer analysis of the metals at six stations on Chopan river and four tube wells within the radius of about 10km from fertilizer industry has been carried out.

The metals like Copper, Iron, Zinc and lead were analyzed. The objective of the present work was to determine the quality of water supplied to rural community in order to estimate the health implication and to maintain the aquatic biota.

### MATERIAL AND METHODS

Water samples were collected for three seasons *i.e.* summer, Rainy and winter. Samples within the 10 km from Fertilizers industry were collected from ten points, out of these 10 points, four are tube wells and six stations are on Chopan River.

All the samples were collected in polythene bottles for analysis. In the present study metal analysis has been carried out by atomic absorption Spectrophotometer at different wavelengths.

Before measurement the instruments were calibrated for particular element, thereafter the samples were run for particular element. The instrument gives the reading directly in mg/l.

### RESULT AND DISCUSSION

Heavy metals like Copper in trace amount is required by living organisms for various enzymatic reactions but excessive concentrations may cause poisonous. It also has a property to substitute the position of other metals in the body

**Table - 1: Seasonal metal analysis of four Tube Wells (2004)**

		Copper	Iron	Zinc	Lead
GT <sub>1</sub>	S	ND	0.38	0.26	0.053
	R	ND	0.18	0.09	ND
	W	ND	0.04	0.02	ND
GT <sub>2</sub>	S	ND	0.8	1.3	0.03
	R	ND	0.46	0.98	ND
	W	ND	0.35	0.84	ND
GT <sub>3</sub>	S	ND	0.51	0.68	0.08
	R	ND	0.21	0.4	ND
	W	ND	0.21	0.25	ND
GT <sub>4</sub>	S	ND	2.22	0.46	0.016
	R	ND	1.16	0.18	ND
	W	ND	0.32	0.1	ND

The values are expressed in mg/l

when absorbed in excess. It inhibits the absorption of zinc, which may cause abnormal foetal growth.

The desirable limit is 0.05 mg/l. In the present study Copper was below the detection limit in tube well as well as in river water. All kinds of water contain appreciable amount of iron. It is one of the most abundant elements of the rocks and soil. Desirable limit is 0.3 mg/l. and maximum 1.0 mg/l was fixed for drinking water (IS: 10500). In the present study iron content in tube wells were ranged from nil to 2.22 mg/l. Iron content was found to be lowest in winter seasons and maximum in the summer season. Station GT<sub>2</sub> showed higher value of Iron content throughout the year, while Iron at other stations is within permissible limits. In case of Chopan River it was ranged from nil to 0.5 mg/l. during the year 2004.

Presence of lead in water showed adverse effect on various physiological process of living organisms. Excessive concentration causes lead poisoning. Indian<sup>2</sup> Council for Medical research fixed the maximum permissible limit of 0.1 mg/l. for drinking water.

In the study period the lead content in the range of nil to 0.084 mg/l. was recorded in tube well whereas in the river water it was below detection limit. Heavy metals like Zinc, is one of the vital elements needed in trace amount for various

**Table - 2: Seasonal metal analysis of four Chopan rivers (2004)**

		Copper	Iron	Zinc	Lead
R <sub>1</sub>	S	ND	0.24	0.068	ND
	R	ND	0.2	ND	ND
	W	ND	0.06	0.015	ND
R <sub>2</sub>	S	ND	0.3	0.075	ND
	R	ND	0.2	ND	ND
	W	ND	0.07	0.03	ND
R <sub>3</sub>	S	ND	0.35	0.04	ND
	R	ND	0.2	ND	ND
	W	ND	0.15	0.04	ND
R <sub>4</sub>	S	ND	0.3	0.1	ND
	R	ND	0.2	ND	ND
	W	ND	0.1	0.03	ND
R <sub>5</sub>	S	ND	0.25	0.09	ND
	R	ND	0.2	ND	ND
	W	ND	0.12	0.03	ND
R <sub>6</sub>	S	ND	0.2	0.062	ND
	R	ND	0.2	ND	ND
	W	ND	0.12	0.03	ND

The values are expressed in mg/l

metabolic activity of plants and animals. It is a component of metalloenzyme in the body, it is involved in the synthesis of DNA and RNA and is required for normal foetal growth. But in excess caused toxic effect.

In the present study, in tube wells it was ranged from 0.09 mg/l. to 1.3 mg/l. Whereas in case of Chopan river it was ranged in between 0.015 mg/l to below detection limit.

### Conclusion

The assessment of water samples from different sources by various methods shows that few water samples are good for drinking as well as domestic purpose. However in the study area a few water samples particularly nearby fertilizer industry are undesirable for drinking based on 3,4 Fe and Zn content. The awareness regarding prevention against diseases is necessary among villagers. Continuous monitoring is required for safe drinking water purpose.

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