

## A case study of quality of underground water in relation to human health of Sehore town M.P. India

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### ABSTRACT

Alterations and adulteration in physical, chemical and biological characteristics of water may cause harmful effect on human and aquatic biota. Addition of excess of undesirable substance to water makes it harmful to human, animal and aquatic life. It causes significant deviation from the normal activities of various living communities in or out water. Eight different water samples from sehore are have been collected during Dec. 2008 and analyzed. The values obtained were compared with standards prescribed by WHO and ISI 10500-91 and also compared with results of the pre monsoon samples. In the present study only one water samples is in the permissible limit and others are not, TH, Alkalinity, Ca<sup>2+</sup>, Turbidity, are found to be higher then prescribed limits which indicate poor water quality.

**Key words:** Surface & Subsurface water, physico-chemical parameters and human health.

Water is mostly used for industrial and municipal purposes. In order to ensure the right quantity of water for this purpose it is extremely important to monitor water supply with all the aspects into consideration. Ingestion of polluted water can result in various serious health hazards.

The area in question is apart of Malwa region. The present area is bounded by latitude 23°7'-23°17'N and longitude 76°57'-77°12' E as per survey of India toposheet Numbers 53A\16 as 55E\16. The average rainfall is 12 || mm. Water samples of various hand pumps and tube wells from Eight stations were collected in polythene bottles as per the standard procedure and were transported to laboratory for various chemical analysis.

The physico-chemical paramters such as pH, Temperture, Turbidity, Total Alkalinity (TA), Total hardness (TH), Calcium (Ca<sup>2+</sup>), Magnesium (Mg<sup>2+</sup>), Sodium (Na<sup>+</sup>), Potassium (K<sup>+</sup>), chloride (Cl<sup>-</sup>), Sulphate (So<sub>4</sub><sup>2-</sup>), Nitrate (No<sup>3-</sup>), were determined using standard method Reagents used for the present investigation were AR grade and Double Distilled water was used for preparing various solution.

The average values of physicochemical parameters during Dec - 2008 presented in Table 2. Determination of chemical characteristics is

essential for assessing the suitability of water for drinking, industrial and households uses. The observed pH values show that almost all the water samples are in permissible limit as prescribed by WHO. Turbidity is higher/greater in samples taken in post monsson season then those of pre-monsoon samples. The possible reason may be the depletion of groundwater level. Alkalinity also increase along with and these Fig. 1.

Hardness of water depends on the mainly concentration of calcium or magnesium salts or both. Hardness of water is objectionable for it use into laundry and domestic purpose, since, these consumes a large quantity of soap leading to enormous increase in the hardness of groundwater.

**Table 1: Sampling points and places**

Sampling No.	Name of the site
A1	Machli pull
A2	Jangli Ahata
A3	Indore naka
A4	Gang
A5	Kasba
A6	Mandi
A7	English pura
A8	Housing Board

Table 2

S. No.	Parameters	Samplingpoints								WHO1993		ISI 10500-91	
		X1	X2	X3	X4	X5	X6	X7	X8	Min	Max	Min	Max
1.	pH	7.5	7.6	7.4	8.1	7.4	7.5	7.5	7.8	6.7	7.7	6.8	8.5
2.	Turbidity	6.0	1.7	0.2	24.2	17.7	1.8	16	0.1	3.8	8.6	-	10
3.	Alkalinity	320	280	410	90	360	300	80	360	140	614	120	200
3.	T.H.	500	96	480	90	520	80	450	500	168	923	500	300
4.	Mg <sup>2+</sup>	80	08	130	46	40	40	150	250	25.34	153.2	150	30
5.	Ca <sup>2+</sup>	420	188	350	44	480	40	200	250	25.65	117.8	100	75
6.	Cl <sup>-</sup>	200	150	100	22	240	400	215	300	69.02	477.5	250	250
7.	SO <sub>4</sub> <sup>2-</sup>	50	16	50	9.4	9.5	9.0	1.2	20	39.73	93.39	250	200
8.	Na <sup>+</sup>	22	20	22	18	17	19	15	15	15	73	200	200
9.	K <sup>+</sup>	0.2	0.2	0.2	0.3	0.2	0.1	0.3	0.2	0.6	3.4	-	-
10.	NO <sub>3</sub> <sup>-</sup>	14	12	11	Nil	Nil	Nil	Nil	Nil	0.035	0.158	45	45

All parameters in mg/l except pH, Turbidity (NTU)

All these results show that in Pre-monsoon season the water level is high therefore the concentration of all the parameters becomes low but the post-monsoon season the water level falls down causing rise in the concentration of all the parameters.

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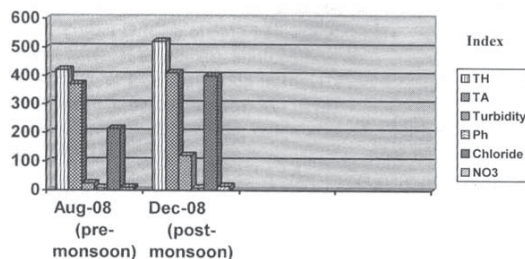


Fig. 1: Comparative plot of various results of different parameters of ground water in pre-monsoon and post-monsoon season 2008

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