



## Studies on water quality of village Maniyari Darbhanga, Bihar

**Mithilesh Kumar**

Assistant Professor, Department of Zoology, MLS College, Sarisab-Pahi, Madhubani, LNMU, Darbhanga, Bihar, India

### Abstract

Evaluation of different physico-chemical parameters of ground water of village, Maniyari (Bahadurpur Block, Darbhanga District, Bihar) was carried out to study the water quality of the water samples. Samples were collected from different sources of different locations throughout the year 2019. Parameters studied were P<sup>H</sup>, EC, TDS, Fluoride (F<sup>-</sup>), Sulphate (SO<sub>4</sub><sup>-2</sup>) Chloride (Cl<sup>-</sup>), Nitrate (NO<sub>3</sub><sup>-</sup>), etc.

**Keywords:** water samples, P<sup>H</sup> meter, etc

### Introduction

Maniyari is a small village about 5 km away from Darbhanga and about 2 km away from the river, Bagmati. This small village houses about 3 to 5 thousand people and still today. This village is deprived of better road, sanitation availability of potable water, etc. People of this village depend on tubewells and wells for drinking, bathing, cooking and washing the clothes. Water of this village changes into yellow with heavy sediments which kept for some time and ground water is available at lower level of 15 to 20 feet which also gives to bacterial infection. The safe and potable water is far from the reach of people of this village. This entire Bagmati, belt is known for poor quality of water. The water of this belt is highly contaminated with iron and to some extent fluoride ion (F<sup>-</sup>). This village Maniyari is worst prey to poor unpotable water. Thus the water-borne –disease every year breaks up as an epidemic taking lives of thousands of people including children.

Thus, it has become necessary to evaluate the pollutional level of water of this village and in this present work an attempt has been made to characterize drinking water quality with respect to parameters as shown above.

### Materials and Method

The sample of drinking water from different tubewells and wells from different location have were collected as directed by APHA. These samples were analyzed for parameters stated above at Zoology Department, MLS College Sarisab-Pahi, Madhubani, Bihar by usual standard methods as prescribed by APHA. Temperature and P<sup>H</sup> were measured at time of collection while other parameters sulphate (SO<sub>4</sub><sup>-2</sup>) nitrate (NO<sub>3</sub><sup>-</sup>), alkalinity, chloride (Cl<sup>-</sup>), iron fluoride (F<sup>-</sup>) were carried out by usual methods, where reagents used were of AR grade.

### Results and Discussion

The observed values of physico-chemical parameters are shown in the Table-1 Table – II for the water of tubewells 1 and wells 2 respectively.

**Table 1:** Physico-Chemical Parameters of Tubewell Water “1” of Maniyari Village

SI. No.	Parameters	Maximum Value (in ppm)	Minimum Value (in ppm)
1.	Sulphate	27.02	23.09
2.	Turbidity	26.6	21.04
3.	P <sup>H</sup>	7.05	6.82
4.	Water Temperature	23.8	22.83
5.	HCO <sub>3</sub> <sup>-</sup>	0.61	0.26
6.	Total	0.81	0.26
7.	Fe	0.6	0.5
8.	F <sup>-</sup>	1.78	1.05
9.	EC	156.28	135
10.	Chloride	118.89	114.86
11.	TDS	246.91	233.92
12.	CO <sub>3</sub> <sup>-2</sup>	0.18	0.06
13.	Total Alkalinity	33	25

**Table 2:** Physico-Chemical Parameters of Well “2” of Maniyari Village.

SI. No.	Parameters	Maximum Value	Minimum Value
01.	HCO <sub>3</sub> <sup>-</sup>	0.86	0.61
02.	CL <sup>-</sup>	80.88	76.78
03.	Total Alkalinity	65	61
04.	EC	210	201
05.	Total Hardness	53	47
06.	Turbidity	59	48
07.	Fe	0.7	0.4
08.	F <sup>-</sup>	1.07	1.06
09.	Water Temperature	14	13
10.	Sulphate	26.30	21.00
11.	CO <sub>3</sub> <sup>-2</sup>	0.17	0.13
12.	Nitrate	0.26	0.18
13.	P <sup>H</sup>	7.76	7.08

From tables it is clear that the chloride ion is very low does not have any toxic effect.

The EC and  $P^H$  are well within permissible limit (ISI, 1983). The concentration of sulphate ion is obviously high but does not exceed the limit and does not produce any harmful effect.

As far as turbidity is concerned, it is higher and poses harmful indications. From data it may be seen that the total alkalinity is much greater although it is enough to remove the effect of fluoride concentration which otherwise may create skeleton problems (WHO, 1993). It is also clear that fluoride ion concentration is within the permissible limit (1 ppm) (APHA, 1980). From table it is evident that nitrate ion concentration is much lower and thus water is free from any nitrate hazards. Water is heavily concentrated with iron and much above the permissible limit and diarrhea, ultimately graying of hairs, gastric troubles, abortions of pregnant women and other water-borne-diseases related to high iron concentration can be seen among the people of this locality (Trivedy and Goel, 1986 and Trivedy, 1995).

On the basis of observation, it is clear that the water of this area is not safe either for drinking or bathing, cooking and other purposes.

Thus, it is advised that ground water resources which lacks proper sanitation and protection from contamination should also be properly monitored and steps should be made to make available pure and potable water to the people of this area by preventing pollution at every level in drinking water.

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