

Assessment of ground water of Nakta Diyara Village, Near Digha, Patna (Bihar State) in Monsoon Season

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Abstract : Ground water sample from dug well were collected during monsoon season from seven different sampling location situated in Nakta Diyara village, near Digha municipal area of Patna city, Patna (Bihar). Five Physico - Chemical parameters were analysed and the results were compared with water quality standard prescribed by Bureau of Indian Standards (IS - 10500:1991). The procedure for analysis of water followed 'Standard method for analysis water' APHA 21st edition and conclusion regarding the suitability of the use of such water are made.

(Keywords : Dug wells, Ground water, Physico - Chemical parameters)

Introduction

Water is extremely essential for survival of all living organism. Life can not exist on this planet without water. Approx 97.2% of water on earth is salty and only 2.8% is present as fresh water from which about 20% constitute ground water¹. Ground water considered to be much cleaner than surface water. However, several factors such as discharge of industrial, agricultural and domestic waste, land use practice, geological formation, rainfall pattern and infiltration rate affect the ground water quality and once contamination of ground water in aquifers occurs, it persists for hundreds₂ of years because of very low movement in them₂.

Various worker in our country have carried out extensive studies on fluoride, Das and co-workers₃ have reported fluoride hazards inground water I Orissa. Jha and Verma₄ studied

water quality in bihar. Patnaik *et al*⁵ reported water pollution in industrial area.

Experimental

Material and methods:

Water sample were representative to be tested and they were collected with utmost care to ensure that no contamination occurs at the time of collection or prior to examination. Water samples were collected from different dug wells in seven different spots of Nakta Diyar village near Digha Patna (Bihar)during monsoon season. Samples were collected in good quantity polyethene bottle of one litre capacity and analysed by methods recommended by APHA(2005)⁶.

The seven collected water sample were analysed under various physico – chemical analysis and method of testing parameter for pH, Arsenic, alkalinity, Fluoride, Nitrate under desirable and permissible limit⁷ given in table (1)

Results and Discussion

The physico – chemical parameters showed considerable variation from seven sampling locations S1 to S7 in monsoon season. The result of physico- chemical analysis of the sample is presented in table 1.

1. pH:-

pH is one of the important factors in water quality managements⁸. pH of water samples ranged from 7.9 (S3) to 6.8 (S2). Though pH of water samples at some sites were acidic while pH of some other samples were alkaline. pH of all seven water samples of the study area were within

Physico- chemical analysis of ground water of Nakta Diyara village (Near Digha), Patna from different sampling sites in Monsoon Season (June – September 2009)

Sample No.	Site or Location	Source of Sample
S1	At the door of Mr. Ram Narayan Ray	Dug Well
S2	At the door of Mr. Sukh Sagar Ray	Dug Well
S3	At the door of Mr. Upendra Ray	Dug Well
S4	At the door of Mr. Jay Ram Ray	Dug Well
S5	At the door of Mr. Dinawar Pahalwan	Dug Well
S6	At middle space of village	Dug Well
S7	At the door of Middle school	Dug Well

Table - 1

Sl. No.	Parameter	Desirable Limit	Permissible Limit	S1	S2	S3	S4	S5	S6	S7
1	pH	6.5	8.5	7.2	6.8	7.9	7.1	6.9	6.9	7.3
2	Arsenic (ppb)	50	No relaxation	20.30	20.00	30.50	10.30	20.20	10.00	20.60
3	Alkalinity as CaCO ₃ mg/l	200	600	340	444.0	456.0	448.0	556.0	284.0	210.0
4	Fluoride (as F ⁻) mg/l	1.0	1.5	0.63	0.76	0.74	0.68	1.09	0.76	0.70
5	Nitrate (as NO ₃ ⁻) mg/l	45.00	No relaxation	0.8	0.9	0.8	0.8	0.6	0.9	0.9

the permissible limits (6.5 to 8.5) as recommended by BIS: 10500,1991 for drinking water.

2. Arsenic:

The arsenic values were recorded in our sample from 30.5 ppb(S3) to 10 ppb(S6). Arsenic of all sample were well within permissible limit.

3. Alkalinity:

The maximum alkalinity value of 556 mg/l was recorded in sample (S5) and the minimum value of 210 mg/l was recorded in the water sample (S2). Alkalinity of all the seven water sample were well with in permissible limit.

4. Fluoride:

The value of fluoride in different water samples during monsoon season varied from a

maximum value of 1.09 mg/l (S5) to a minimum value of 0.63 mg/l(S1). Thus all the values were well within permissible limit.

5.Nitrate:-

During monsoon season, the nitrate value varied from maximum value of 0.9 mg/l (S2,S6,S7) to a minimum value of 0.6 mg/l (S5). All the nitrate value were well with in permissible limit.

Conclusion :

In the current study the ground water sample of dug well taken from seven different sampling location (S1 to S7) under five different parameters namely pH, Arsenic, Alkalinity, Fluoride and Nitrate content comes under permissible limit and indicate good quality of water and is fit for drinking purpose.

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