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ASSESSMENT OF PHYSICO-CHEMICAL STATUS OF GROUND WATER NEAR THE CHHAPRAULA INDUSTRIAL AREA GREATER NOIDA,UTTAR PRADESH, INDIA

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ABSTRACT

The contemporaneous study was meant to examine the ground water samples and evaluate the physico-chemical prestige of the samples collected from five villages around the Chhapraula Industrial Area in Greater Noida, Uttar Pradesh, India.These villages are: Sadopur, Achheja, Sadullapur, Bishnuli, and Khera Dharampura, a rural area about 30km from Delhi. The physic chemical parameter like pH value, turbidity, total dissolved solid(TDS) and general characteristics i.e. fluoride(F), Iron(Fe), Nitrate(NO_3), Sulphate(SO_4) and total hardness were determined and compared the results with the standard values given in IS 10500:2012 and IS 3025 (parts) according to the Center pollution control board (CPCB).

I. INTRODUCTION

Water is one of the mostvital substances needed to sustain human life, animals, plants and other living beings. Deprived of water no life is conceivable on earth. Now a days, water pollution is a scorching subject of all over the world. The condition of water pollution in India also influences into alarming position. All the water resources of our country such as rivers, lakes, ponds as well as ground water have become much more contaminated. A satisfactory water resource for forthcoming generation is not only a provincial concern but also a comprehensive anxiety. In our nation fresh water prosperity is under menace due to the inspiration of naturals & human accomplishments (shrivastava et al.,2011). As the development progress ion endures, water pollution glitches have become progressively apparent and have led to thought ful biological and conservation a glitches. Industrial manufacture deprived of passable esteem for conservation a influences has augmented water and air pollution, and has led to soil dilapidation and huge scale comprehensive impressions such as acid rain, global warming and ozone diminution. The foundations for ground water supply mostly depend upon the rainfall and the subsequent filtration of the water into the earth. Another imperative influence is the superiority of the soil(Jameel et al.,2012).

In all the ordinary possessions, water is unarguably the utmost essential and valuable. Life initiated in water and life is encouraged with water. 97% of the world's water is found in oceans. Only 2.5% of the world's water is non-saline fresh water. There are organisms, such as anaerobes, which can endure deprived of oxygen. But no organism can endure for any length of time deprived of water. It is a worldwide solvent and as a solvent it delivers the ionic stability and nutrients, which provision all procedures of life. In India the foremost foundation of water used to encounter the domestic, agricultural and industrial requirements. The ground water is well-

defined as water that is originate subversive in cracks and spaces in soil, sand and rocks. This basis has two dissimilar functions; initially, it is a momentous source of both urban and rural population's water supply and furthermore it tolerates numerous wetland ecosystems(Jameel et al.,2012).

Groundwater is used for domestic, agriculture and industrial determination in maximum fragments of the ecosphere. The human accomplishments like agriculture and domestic issue large number of pollutants into the water organizations. In India, ponds, rivers and ground water are used for the domestic and agriculture determinations. The most important foundations of water are rainfall, surface water including rivers, lakes and groundwater encompassing dig wells, bore wells etc. In topical years, the development of industry, expertise, populace and water use has augmented the anxiety upon both our land and water possessions. Locally, the superiority of ground water has been dishonored. Municipal and industrial wastes, chemical fertilizers, herbicides and pesticides have entered the soil, penetrated some aquifers and tainted the ground-water excellence. Supplementary contamination difficulties contain sewer leakage, damaged septic-tank action and landfill leachates. In particular seaside areas, concentrated pumping of fresh ground water has produced salt water to encroach into fresh-water aquifers(Jameel et al.,2012).

II. MATERIALS AND METHOD

2.1 Study Area

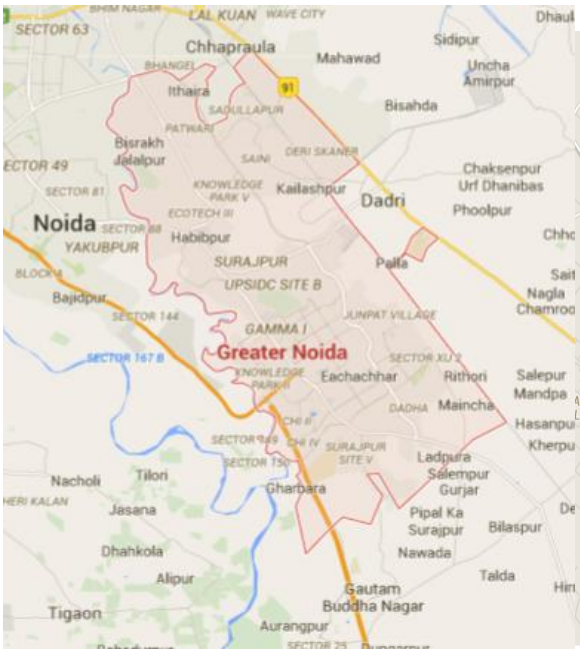
The Greater Noida (Uttar Pradesh) area is designated in which the 5 villages around the Chhapraula Industrial Area will be examined. These villages are: Sadopur, Achheja, Sadullapur, Bishnuli, and Khera Dharampura, a rural area about 30km from Delhi. There are innumerable kinds of prevailing industries and industrial plantations. The wastewater existence engendered is satisfied into the nearby water resources through underground pipe line which pollute the ground water. The people are consuming canal water, tube well water as well as municipal water for their quotidian requirement. Literature investigation divulges that no ground water excellence organisation studies have been accepted in this province.People incarnate in these villages with basic profession are cultivation and they exploit ground water for agriculture, domestic and for drinking determination. The present study is deliberate and commenced. The physico-chemical exploration of the tasters of five villages are approved out like Temperature, pH, Conductivity, Total Liquefied solids Liquefied oxygen, chemical oxygen demand, Nitrate, Sulphate Phosphate, Chloride, Hardness, Sodium and potassium .

All the tasters were unruffled in one litre capability polythene bottle, the well disembowelled sample bottles were sluiced systematically with the sample water to be collected. After gathering the samples, the bottles were proximately padlocked strongly. Each taster bottle was evidently categorized with a marker and pertinent details were logged. All the sample bottles were closed and carried to the research laboratory as soon as conceivable after defensive them from direct sunlight during conveyance. The sample composed from hand pump everywhere the area of examination for monthly intermission from January 2015 to April 2015. All the water samples were scrutinized within 12 to 24 hrs after assortment. The temperatures of the samples were unrushed in the field itself at the time of sample assortment. The samples were kept in refrigerator continued at 4ºC.

VILLAGE	CO-ORDINATES
Sadopur	28°35'4"N 77°30'49"E
Achheja	28°35'46"N 77°29'56"E
Sadullapur	28°35'14"N 77°29'17"E
Bishnuli	28°36'46"N 77°30'7"E
Khera Dharampura	28°32'32"N 77°27'29"E

Table1. Villages and there coordinates

Fig 1: Map of IndiaFig 2: Map of Uttar Pradesh



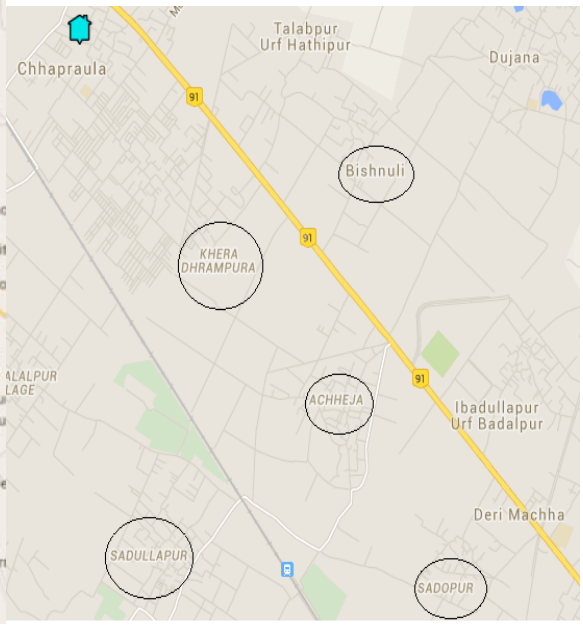


Fig 3: Map of Greater Noida in Gautam Buddh Nagar District

Fig 4: Sampling sites in Greater Noida map

2.2 Results:

As per the IS 10500:2012 and IS 3025 (parts) used for the willpower of the Organoleptic and physical parameters, General stricturesregarding substances objectionable in unwarranted amounts, Parameters concerning toxic substances. The following table 1 and 2 give the result of the various samples.

Table 1. Organoleptic and physical parameters

Characteristic	**Method (Ref. to Parts of IS:3025)**	**Result**	**Unit**	**Requirement/Limit (As per IS 10500:2012)**	
				Desirable	**Permissible**
(1) pH value	Part 11			6.5	8.5
Sample 1		7.81		6.5	8.5
Sample 2		6.97		6.5	8.5
Sample 3		7.79		6.5	8.5
Sample 4		7.07		6.5	8.5
Sample 5		7.60		6.5	8.5
(2) Turbidity	Part 10		NTU	1	5
Sample 1		3.89		1	5
Sample 2		8.64		1	5
Sample 3		1.77		1	5
Sample 4		0.33		1	5
Sample 5		1.91		1	5
(3)Total dissolved solids (TDS)	Part 16		mg/L	500	2000
Sample 1		765		500	2000
Sample 2		357		500	2000
Sample 3		905		500	2000
Sample 4		394		500	2000
Sample 5		1537		500	2000

Table 2. General parameters concerning Substances Undesirable in excessive amounts

Characteristic	Method (Ref. to Parts of IS:3025)	Result	Unit	Requirement/Limit (As per IS 10500:2012) Desirable	Permissible
Fluoride (F)	Part 60		mg/L	1	1.5
Sample 1		0.31		1	1.5
Sample 2		1.23		1	1.5
Sample 3		0.79		1	1.5
Sample 4		2.21		1	1.5
Sample 5		0.42		1	1.5
Iron (Fe)	Part 53		mg/L	0.3	No relaxation
Sample 1		0.12		0.3	No relaxation
Sample 2		0.34		0.3	No relaxation
Sample 3		0.21		0.3	No relaxation
Sample 4		0.11		0.3	No relaxation
Sample 5		0.25		0.3	No relaxation
Nitrate (NO_3)	Part 34		mg/L	45	No relaxation
Sample 1		12.21		45	No relaxation
Sample 2		13.12		45	No relaxation
Sample 3		14.33		45	No relaxation
Sample 4		7.42		45	No relaxation
Sample 5		17.22		45	No relaxation
Sulphate (SO_4)	Part 24		mg/L	200	400
Sample 1		50.5		200	400
Sample 2		53.7		200	400
Sample 3		43.8		200	400
Sample 4		28.1		200	400
Sample 5		54.0		200	400
Total Alkalinity (as $CaCO_3$)	Part 23		mg/L	200	600
Sample 1				200	600
Sample 2				200	600
Sample 3				200	600
Sample 4				200	600
Sample 5				200	600

(6) Total Hardness (as $CaCO_3$)	Part 21		mg/L	200	600
Sample 1		142.21		200	600
Sample 2		180.43		200	600
Sample 3		120.22		200	600
Sample 4		208.31		200	600
Sample 5		150.62		200	600

III. CONCLUSION AND EXPECTED OUTCOMES

By the experiments and analysis the ground water in the village Khera Dharampura is comprehend physical parameters overhead than the anticipated limit, so it is not fit for drinking.

The ground water excellence valuation helps us to recognize the noteworthy parameters of receiving better statistics about source of pollution. By procurement the results it is investigated that, at contemporary the metal ion concentration is contain at the levels which will be perilous for humans or not as per the CPCB.It will be patterned that, the ground water source will be entirely polluted and become unhealthy for drinking and other purpose. The preventative procedures should be instantaneously taken to circumvent the significances as per the procedures of IS10500:2012.

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