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Water Pollution Minimize to Protect the Life of Human Being

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Abstract: ***Water pollution is one of the most serious problems facing humanity and other life forms on our planet today. Water pollution is defined as the contamination of the physical and biological component of earth system to such an extent that normal environmental processes are adversely affected! Pollutant can be naturally occurring substances or energies but they are considered contaminant in excess of natural level. Any use of natural resources at a rate higher than nature's capacity to restore itself can result in pollution of air, water and land. Pollution prevention is a major global concern because of the harmful effects of pollution on a person's health and on the environment. Environmental pollution comes in various forms, such as: air pollution, water pollution, soil pollution, etc. Everyone is a stakeholder as we are all inhabitants of this one and only mother earth. Each person can contribute something to advance environmental pollution mitigation measures. Environmental protection means caring for our resources and subsequently for ourselves and ensuring a sustainable future for generations to come will have a better environment. You and I should therefore accept personal responsibility for the success of the environmental protection programs of our respective community by cooperating and actively participating in making the atmosphere pollution free. Help stop pollution today. Although on an individual basis, we can help combat pollution in our own immediate environment, efficient control can be best institutionalized through legislation. Thus, most countries have already addressed the issue by passing some form of pollution prevention measures. Many of the earth's resources are especially vulnerable because they are influenced by human impacts across many countries. As a result of this, many attempts are made by countries to develop agreements that are signed by multiple governments to prevent damage or manage the impacts of human activity on natural resources. This can include agreements that impact factors such as climate, oceans, rivers and air pollution. These international environmental agreements are sometimes legally binding documents that have legal implications when they are not followed and, at other times, are more agreements in principle or are for use as codes of conduct.***

Keywords: contamination, degradation, cooperation, prevention, combat

1. Introduction

Water is vital to the existence of all living organisms, but this valued resource is increasingly being threatened as human populations grow and demand more water of high quality for domestic purposes[1] and economic activities. Water abstraction for domestic use, agricultural production, industrial production, power generation, and forestry practices can lead to deterioration in water quality and quantity that impact not only the aquatic ecosystem, but also the human being on the land. The quality or any body of surface or ground water is a function of either or both natural influences and human activities. Without human influences, water quality would be determined by the weathering of bedrock minerals.

The preservation of aquatic resources for ecosystem and human health and well-being is a paramount concern worldwide and it has become evident that approaches to managing aquatic resources must be undertaken within the context of ecosystem dynamics in order that their exploitation for human uses remains sustainable.

Water quality monitoring for the detection of trends impacts and improvement is essentially required because the available resources are constantly changing. Although it is not always possible to predict new and emerging threat. But water quality monitoring must be maintained. In this investigation some of the ions are detected on which water quality depends as the life of residential population depends on it. Moreover it is essential to know what preventionary steps should be taken to improve the quality of water. Analytical techniques are constantly improving making it possible to detect elements and ions at lower concentration.

2. Materials and Method

The sample were collected in polythene bottles which had been thoroughly washed and filled with distilled water, and then taken to the sampling site. The bottles were emptied and rinsed several times with the water to be collected. The sample bottles were covered immediately after collection and the temperature taken. In the present investigation the ground water samples from twenty villages surrounding Bhopal of Bhopal District in M.P. were collected. Chemical analyses[2] were carried out for the major ions, minor ions, and trace ions concentrations using the standard procedures recommended by American Public Health Association[3]. The analytical data can be used for the classification of water for utilitarian purposes and for ascertaining various factors on which the chemical characteristics[4] of water depend.

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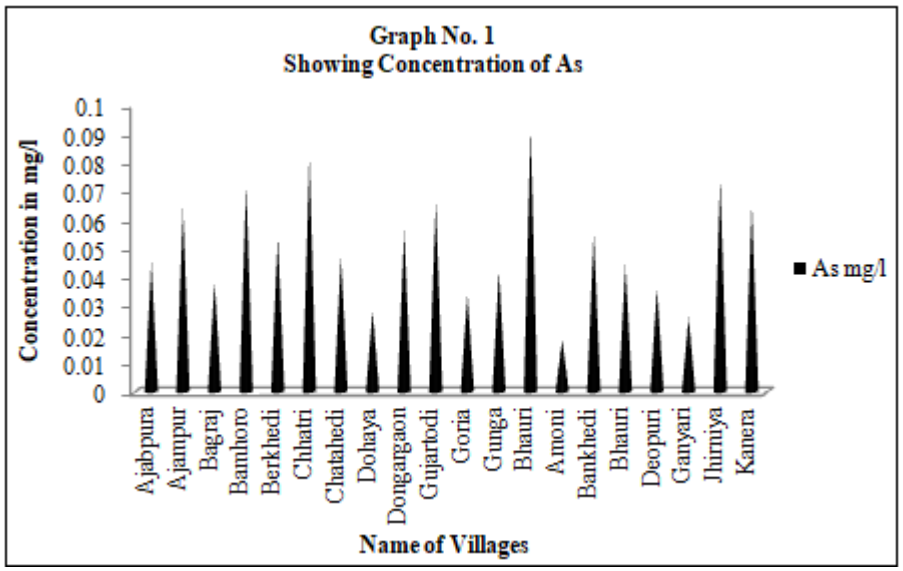
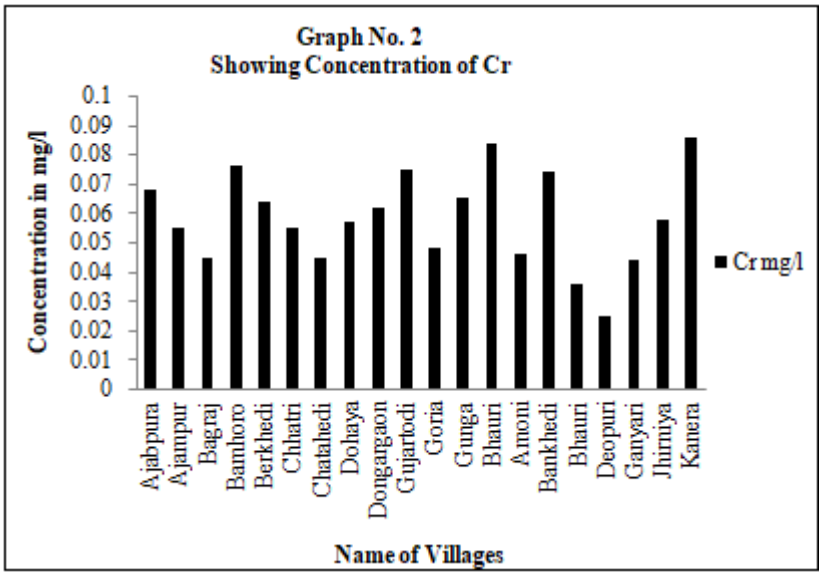
Analytical parameters showing the concentration of various ions in ground water of some villages surrounding Bhopal

S. No.	Name of Villages	TDS (mg/l)	AS (MG/L)	Cr (mg/l)	Fe (mg/l)	SO_4 (mg/l)	Cl (mg/l)	F (mg/l)
1.	Ajabpura	815	0.045	0.068	1.25	250	750	1.25
2.	Ajampur	628	0.064	0.055	1.18	370	620	0.78
3.	Bagraj	725	0.038	0.045	1.42	430	680	0.94
4.	Bamhoro	914	0.072	0.076	1.36	110	570	1.32
5.	Berkhedi	1022	0.054	0.064	1.54	230	460	1.26
6.	Chhatri	856	0.082	0.055	1.28	150	520	1.54
7.	Chatahedi	784	0.047	0.045	1.62	260	640	0.96
8.	Dohaya	1124	0.028	0.057	1.03	340	730	1.65
9.	Dongargaon	796	0.056	0.062	0.66	450	540	1.72
10.	Gujartodi	654	0.066	0.075	1.17	440	660	2.24
11.	Goria	936	0.034	0.048	0.84	260	490	1.98
12.	Gunga	874	0.042	0.065	0.56	330	550	1.86
13.	Bhauri	742	0.092	0.084	0.95	140	720	2.75
14.	Amoni	966	0.018	0.046	0.83	160	530	3.06
15.	Bankhedi	1028	0.055	0.074	1.38	220	650	2.52
16.	Bhauri	736	0.044	0.036	1.05	304	1480	1.48
17.	Deopuri	684	0.036	0.025	1.09	170	470	1.56
18.	Ganyari	846	0.026	0.044	1.27	115	710	1.74
19.	Jhirniya	924	0.074	0.058	0.9	218	560	2.32
20.	Kanera	768	0.065	0.086	0.75	310	640	2.96





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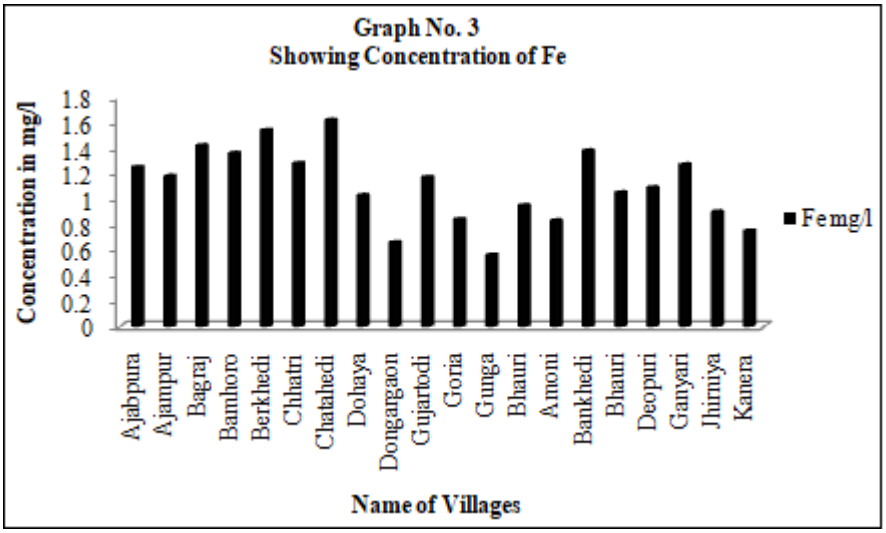

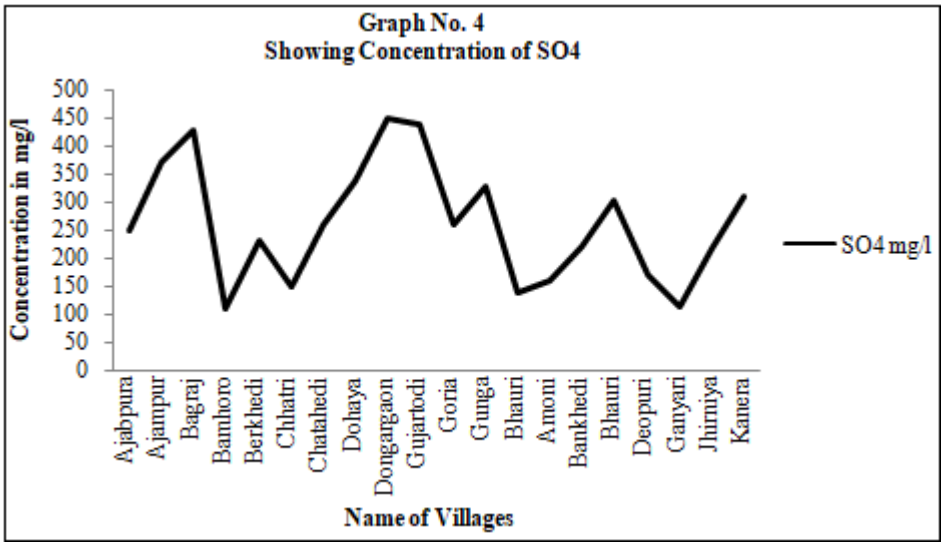

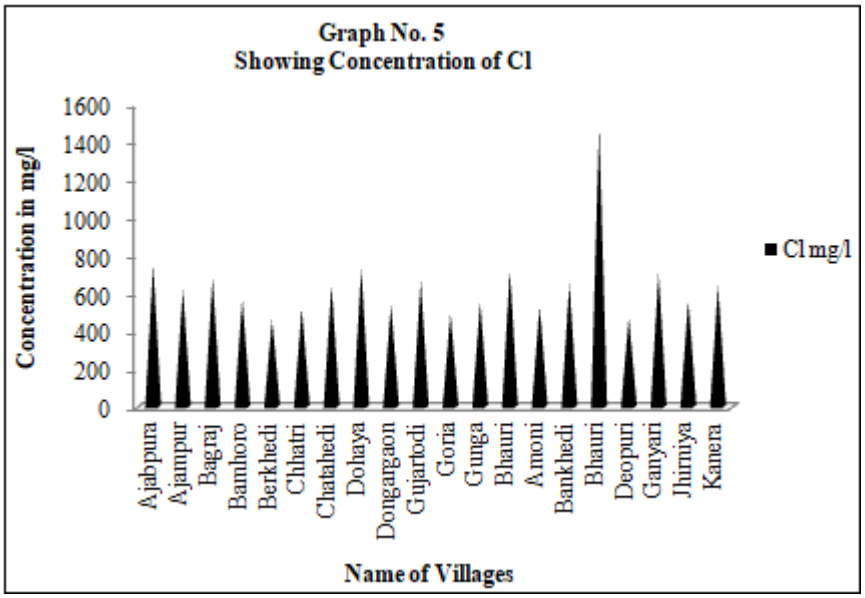

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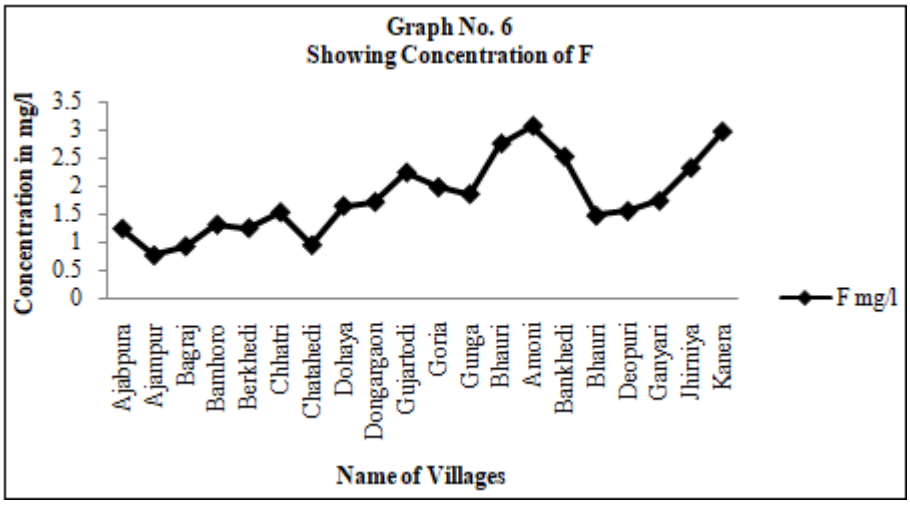

3. Result & Discussion

The Total dissolved solids (TDS) observed from this area is between 628-1124 mg/l and is found that 17 samples are below 1000 mg/l and only three samples has moderate quality around 1000 mg/l. Generally, the higher TDS causes gastro-intestinal irritation to the human beings, but the prolonged intake of water with the higher TDS can cause kidney stones and heart diseases.

Iron (Fe) concentration in natural water is very low. Iron[5] is biologically an important element which is essential to all organisms and present in haemoglobin system. High concentration causes slight toxicity, inky flavour, bitter and astringent taste. Iron contained water[6] makes the teeth and nail black and weak, stickiness of hair and water. The desirable limit is 1.0mg/l. The shortage of iron causes a disease called anaemia and prolonged consumption of drinking water with high concentration of iron[7] may lead to liver disease called as haermosiderosis.

Chromium (Cr) is an essential micronutrient for animals and plants. Chromium is considered as a relative biological and pollution significance element. Chromium is an essential nutrient in man because it helps the body in the use of sugar, protein and fats but at low concentration. The permissible limits is .05mg/l However, intake excess causes various health effects such as skin rashes, stomach upset, ulcer, respiratory problems, alteration of genetic materials, weakness of immune system, kidney and liver damage, and can even lead to death[8].

Chloride (Cl) is a widely distributed element in all types of rocks in one or the other form. Therefore, its concentration is high in groundwater, where the temperature is high and rainfall is less. Mostly, the chlorides are found in the form of sodium chloride in the groundwater. Soil porosity and permeability also has a key role in building up the chloride concentration. Chloride imparts a salty taste and some times higher consumption causes the crucial for the development of essential hypertension[9], risk for stroke, left ventricular hypertension, osteoporosis, renal stones and asthma in human beings. The maximum allowable limit is 1000mg/l. Although, the chloride plays an important role in balancing level of electrolyte in blood plasma, but higher concentration can produce some physical disorders.

The sulphate (SO_4) ion is one of the important anion present in natural water produce catharsis, dehydration and gastrointestinal irritation effect[10] upon human beings when it is present in excess of 150 mg/l. The maximum permissible limit is 400mg/l. It is mainly derived from gypsum on oxidation of pyrites. The sulphide minerals add the soluble sulphate into the groundwater through oxidation process.

One of the main trace elements in groundwater is fluoride (F) which generally occurs as a natural constituent. Fluoride[11] normally accumulates in the bones, teeth and other calcified tissues of the human body. Excess of fluoride in water causes serious damage[12] to the teeth and bones of the human body, which shows the symptoms of disintegration and decay[13], diseases called dental fluorosis and skeletal fluorosis. The higher intake of fluoride may change the metabolic activities of soft tissues[14] (brain, liver, kidney, thyroid and reproductive organs). The permissible limit of fluoride in drinking water is 1.5 mg/l.

Arsenic is introduced in ground water during weathering of rocks & minerals followed by subsequent leaching and runoff (Smedley, 2002). Arsenic contamination is understood to be of geogenic origin[15] and use of arsenic containing insecticide. It is actually the specific geochemical condition that aid in the release of AsIII into ground water[16]. Arsenic release from sediments is attributed mainly to desorption or dissolution of arsenic from iron oxide. This happens mainly due to reducing conditions in aquifers below the so called redox zone or transition between oxidising and reducing conditions a few meters below the water table. Here the higher oxidized AsV reduced to AsIII which is released into ground water. The maximum allowable limit of As is .05 mg/l. The reason for onset of reducing conditions are several, rapid burial of organic matter, high microbial activity or recent anthropogenic activities[17]. The latest WHO evaluation concludes that arsenic exposure via drinking water is casually related to cancer in the lungs, kidney, bladder and skin, the last of which is preceded by directly observable precancerous lesions.

The Arsenic concentration is also showing slight upward trend in some villages producing paddy crop, rice for some consecutive years. There is some specific tendency of roots of rice plants to absorb arsenic from ground water. In these

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location ground water is also rich in Iron. Arsenic is introduced in ground water[18] during weathering of rocks and minerals followed by subsequent leaching and run off. In one or two villages the concentration of Arsenic is increasing a little bit but not in alarming situation. In most of the villages arsenic concentration is found to be within permissible limit. Gradual increase is due to overexploitation of ground water and excessive use of arsenic containing insecticides / pesticides. Arsenic contamination is understood to be of geogenic origin.

4. Conclusion

Ground water analysis for major & minor Ions is essential to assess the quality of water as the village people totally depend on ground water for drinking, irrigation and house hold purposes. In the present investigation TDS value is high only in few cases. The iron concentration is more than permissible limit except in 5, 6 villages. Fluoride concentration is also high than desirable limit in ten villages. High fluoride concentration should be avoided in that location tube well should be discarded, some preventionary steps should also be taken. One should be very alert and cautious about Arsenic concentration. Of course its concentration is low under investigation then also after regular interval its concentration should be certainly analysed. Arsenic is introduced into soil and ground water during weathering of rocks & minerals followed by subsequent leaching and runoff. It can also be introduced by anthropogenic activities. Many factors control Arsenic concentration. The use of insecticide and pesticides should be controlled.

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