Original Research Article

Effective protection of the environment

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Abstract

The wonder of the universe is so old compared to the existence of humans that we have learnt to take it for granted. Air, water, land, flora, fauna have always been there; and will always be. The disintegration of our vital atmosphere has been like slow poison. We realized the damage too late. One of the greatest problems that the world is facing today is that of environmental pollution, increasing with every passing year and causing grave and irreparable damage to the earth. The negative effects of Global warming are heat waves, unusual warm weather, ocean warming, rise in sea level, droughts and floods and coastal flooding, warming of Arctic and Antarctic zones, changes in the pattern and amount of precipitation, species extinction and melting of the glaciers which have proven to be extremely dangerous. It consists of five basic types of pollution, namely, air, water, soil, noise and light all contributing to health problems and a lower quality of life. Environmental impact of pollution can be seen in the deaths and in billions dollars property damage that tornadoes, hurricanes and tsunamis cause leaving behind long-lasting legacy of environmental damage. Effective protection of the environment is critical to sustainable development. Practices such as organic farming, sustainable forestry, natural landscaping, wild gardening or precision agriculture, sometimes combined into sustainable agriculture, are increasingly becoming part of nature and ecology conservation. Individuals, organizations and governments need to come together and join hands to save our precious environment.
Key Word: Sustainable Development, Precious Environment, Tornado.

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INTRODUCTION

The biotic structure and functions of ecosystems, developed by millions of years of biogeochemical evolution and succession, determine more than just environmental quality. Today, humanity's presence on Earth also depends on the ability of ecosystems to maintain the integrity of fundamental ecological processes and provide ecosystem services. The most important ones for human health are those related to environmental security, including mitigation of floods and droughts, healthy food and good quality of water, among others. The integrity of ecological processes at the global scale, however, has recently been seriously endangered. Human impacts have reached an intensity level that is unprecedented in the Earth's history. This period of time since the latter part of the 18th century has been called the "Anthropocene". From a water quality perspective, one of the most important issues is unsustainable catchment development, often due to old paradigm-driven management strategies. Degradation of water and biogeochemical cycles in landscapes results in destabilisation of natural processes essential for ecological integrity. Loss of soil quality is often treated with fertilizer applications additionally contributing to water quality degradation. Recent studies have shown that chemicals used in agriculture, industry, households, and for personal care are making their way into the environment and that many of them are suspected endocrine disruptors. These chemical s include PCBs, pesticides, disinfectants, plastic additives, flame retardants, and pharmaceuticals. There is growing concern about the possible affects of pharmaceuticals and other personal care products (PCPs) that enter surface and ground waters. These substances originate from industry, agriculture, and medical and household activities and they include commonly used products like cosmetics, detergents, and toiletries as well as pharmaceuticals such

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as painkillers, tranquillizers, anti-depressants, antibiotics, birth control pills, estrogen replacement therapies, and chemotherapy agents. These substances have probably been in the environment for as long as they have been in use, but our ability to detect them used to be limited as they occur at trace levels in the environment. However, recent technological developments have produced analytical tools enabling their detection in very low concentrations.

MATERIAL AND METHODS

Ground water samples were collected from twenty different villages of different blocks in Raisen district M.P. Water quality analysis is one of the most important aspects in ground water studies. The objective of the present work is to discuss the physiochemical parameter of groundwater that is suitable for drinking and agriculture. The samples were collected in polytheylene 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. In the present investigation the ground water samples from twenty villages of Raisen District in M.P. were collected and Analysed for some metal ions Calcium, Magnesium, Iron, Manganese and toxic metal Lead, Fluoride and Nitrate are also analysed as these ions pose a serious problem in higher concentration. All the ions are analyzed by A.A.S. The method of collection and analysis are essentially the same as given by APHA (1998)[1].

RESULT AND DISCUSSION

Table I shows the concentration of above mentioned ions and TDS. Calcium and Magnesium are very common in Groundwater of this area. Calcium and Magnesium are essentially required major ions for human health and metabolic activity[2-4]. Calcium content is very common in groundwater, because they are available in most of the rocks, abundantly and also due to its higher solubility. Magnesium (Mg^{2+}) usually occurs in lesser concentration than calcium due to the fact that the dissolution of magnesium rich minerals is slow process and that of calcium is more abundant in the earth's crust. If the concentration of magnesium in drinking water is more than the permissible limit, it causes unpleasant taste to the water. Most of the locations exceed the permissible limit. In study area about 75% locations the concentration of Iron and Manganese is little bit high but not in alarming concentration. Iron is an essential element in both plants and animals metabolism but higher value of iron than permissible limit may cause health hazards. Iron may be present as soluble ferrous or insoluble ferric form. Ground water is contaminated by iron mainly from weathering of ferruginous minerals of igneous rocks such as basalt and sulphide ores of sedimentary and metamorphic rocks. The permissible iron concentration in ground water is 1mg/L prescribed for drinking water[5-7]. Concentration of Iron and manganese in ground water are often higher than those measured in surface water. The most common sources of these elements in ground water are naturally occurring from weathering of iron and manganese bearing minerals and rocks. Manganese (Mn) is very common in soils and sediment. It is commonly found with Iron as mineral oxide coatings on the surface of soil and rock grains. When ground water contacts these coatings the oxides are dissolved and may be transported in the ground water. Dissolved manganese is colourless. It is found in Water as Mn++ ions or as manganese bicarbonate. It is an essential element that is necessary for good health. There are several technologies for reducing the level of manganese in water[8-11]. In the present study except two or three villages the concentration of lead is within permissible limit. Lead (Pb) is an undesirable trace metal less abundantly found in earth crust. Lead is used principally in the production of lead-acid batteries, solders and alloys. Lead is also found in soil, vegetation, animals and food. It is a serious cumulative body poison. Lead inhibits several key enzymes involved in the overall process of haemosynthesis, whereby metabolic intermediate accumulates. Lead in the environment may derive from either natural or anthropogenic sources. Nitrate concentration in the investigated are is high and it is due to anthropogenic activity. Nitrate (NO^{3-}) generally occur in trace quantities in surface water but may attain high levels in some groundwater. It is well known that the nitrogenous fertilizers are one of the important sources for groundwater nitrate for the past two decades[12-14]. Further, nitrogenous materials are rare in geological system. One of the main trace elements in groundwater is fluoride (F^-) which generally occurs as a natural constituent. Bedrock containing fluoride minerals is generally responsible for high concentration of this ion in groundwater. Fluoride normally accumulates in the bones, teeth and other calcified tissues of the human body[15-16]. Excess of fluoride in water causes serious damage to the teeth and bones of the human body, which shows the symptoms of disintegration and decay, disease called dental fluorosis and skeletal fluorosis[17-20]. Consumption of water rich in fluoride content has resulted in a disease called fluorosis[18-20]. This disease in mildest form resulted in very slight opaque whitish area on posterior teeth but with greater severity the disease is widespread and the colour of the teeth changes grey to black. Fluoride is not absorbed in the blood stream. It has an affinity for calcium and gets accumulated in the bones resulting in the mottling of teeth, pain in bones and outward bending of legs from the knees. In most of the locations the concentration of fluoride exceeds the permissible limit.

Table 1: Analytical parameters showing the concentration of various ions in ground water of some villages in raisen district

Sr. No.	Block	Name of Villages	TDS mg/l	Ca mg/l	Mg mg/l	Fe mg/l	Mn mg/l	Pb mg/l	NO3 mg/l	F mg/l
1	Gairatganj	Devrigadhi	896	446	186	1.24	0.58	0.12	52	6.5
2	Gairatganj	Awaria	728	342	135	0.45	0.45	0.09	65	2.6
3	Gairatganj	Maddera	684	514	224	1.68	0.76	0.14	48	2.5
4	Begumganj	Mandla	826	476	168	1.92	0.86	0.16	74	3.9
5	Begumganj	Markheda Tappa	914	524	236	1.86	0.65	0.08	62	5.2
6	Begumganj	Dhimroli	745	616	252	1.58	0.78	0.15	58	3.5
7	Begumganj	Gehuras	715	314	112	0.82	0.44	0.20	84	2.9
8	Begumganj	Jasrathi	922	424	128	1.65	0.74	0.18	78	2.5
9	Begumganj	Jhirpani	1014	636	252	0.74	0.36	0.04	64	3.5
10	Silvani	Khamera	935	376	132	1.45	0.66	0.22	82	5.9
11	Silvani	Pathapoudi	854	445	224	1.72	0.88	0.16	46	4.0
12	Silvani	Vigharra	756	646	262	1.46	0.72	0.20	56	3.4
13	Silvani	Paheria	692	684	276	1.60	0.68	0.07	75	1.8
14	Silvani	Samnapur	884	556	178	1.26	0.80	0.15	77	1.4
15	Silvani	Parasia	1025	532	242	0.56	0.30	0.25	72	2.4
16	Silvani	Patpari	942	442	172	1.54	0.65	0.18	88	1.7
17	Silvani	Marhati	835	624	266	0.44	0.28	0.08	72	3.1
18	Silvani	Narainpur	956	608	228	1.32	0.60	0.06	67	6.6
19	Silvani	Berkhedi	1042	592	212	1.16	0.55	0.13	54	6.4
20	Badi	Thawari	778	574	188	1.42	0.65	0.17	66	5.6

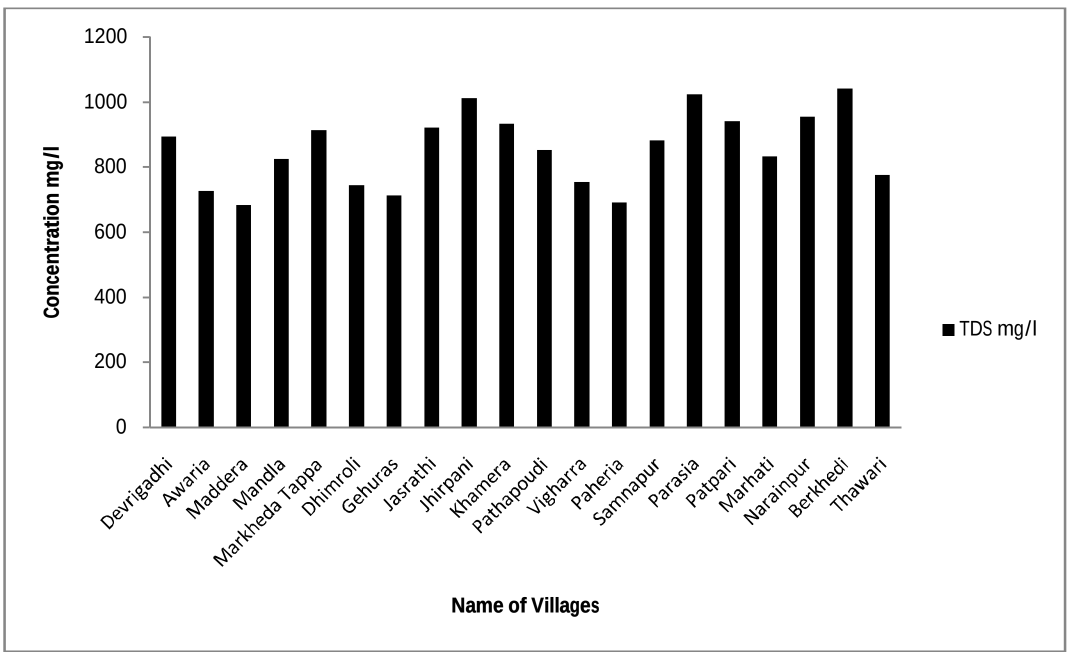

Figure 1: Showing Variation of TDS

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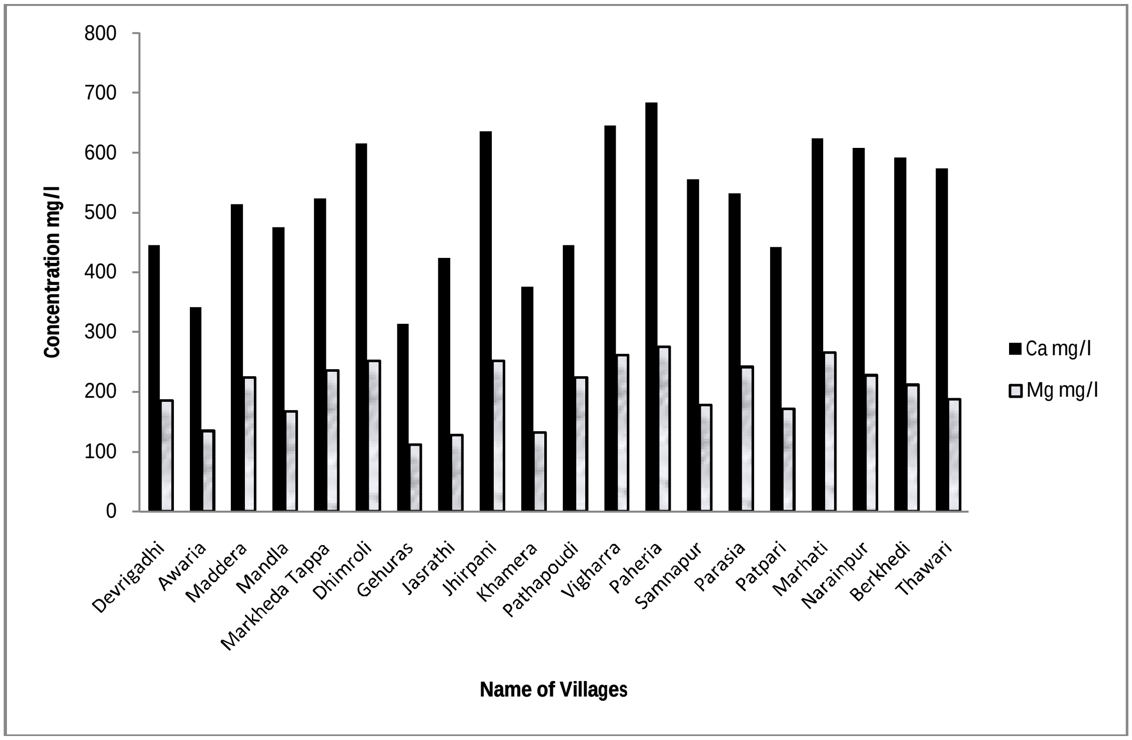

Figure 2: Showing Variation of Ca and Mg

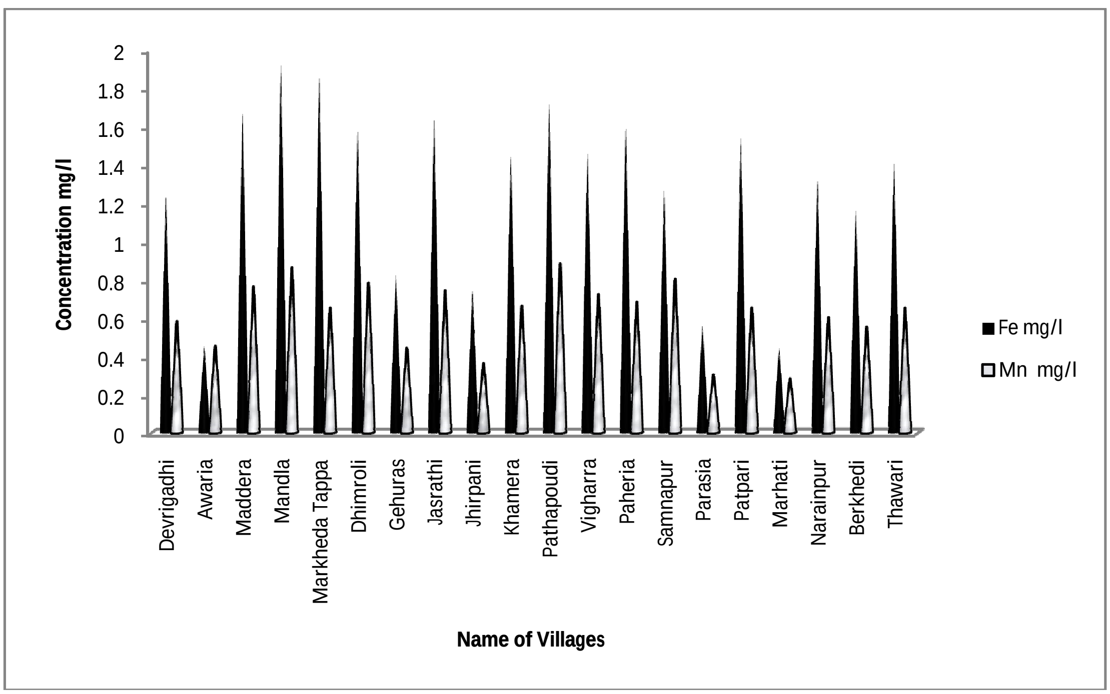

Figure 3: Showing Variation of Fe and Mn

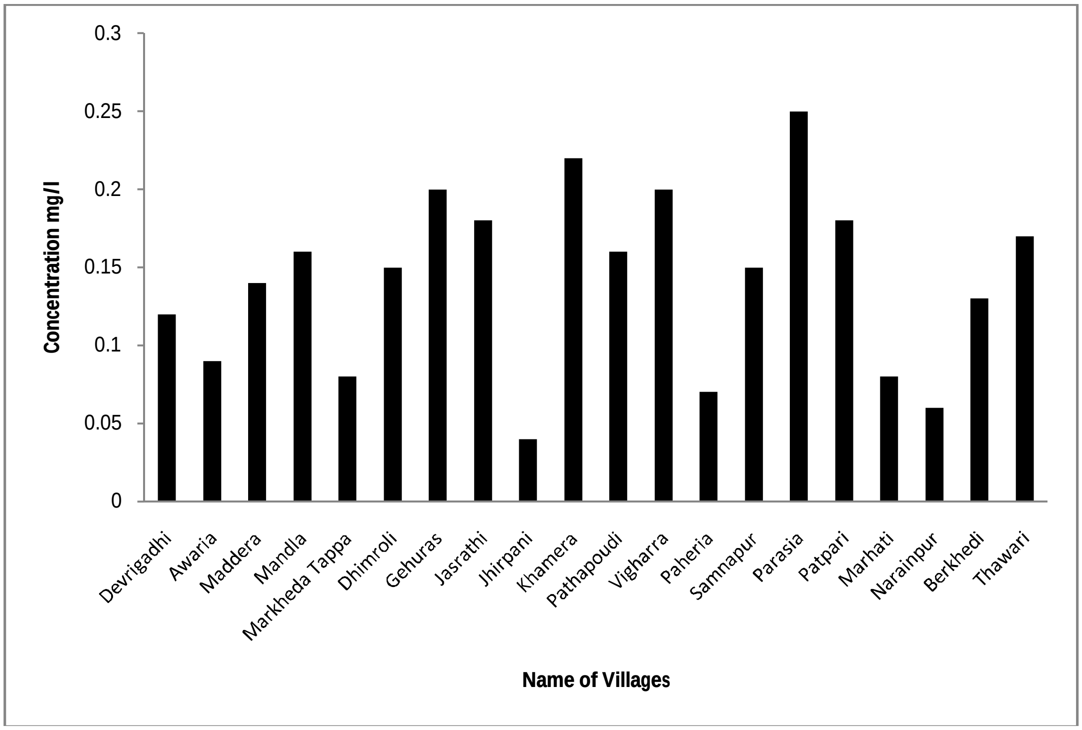

Figure 4: Showing Variation of Pb

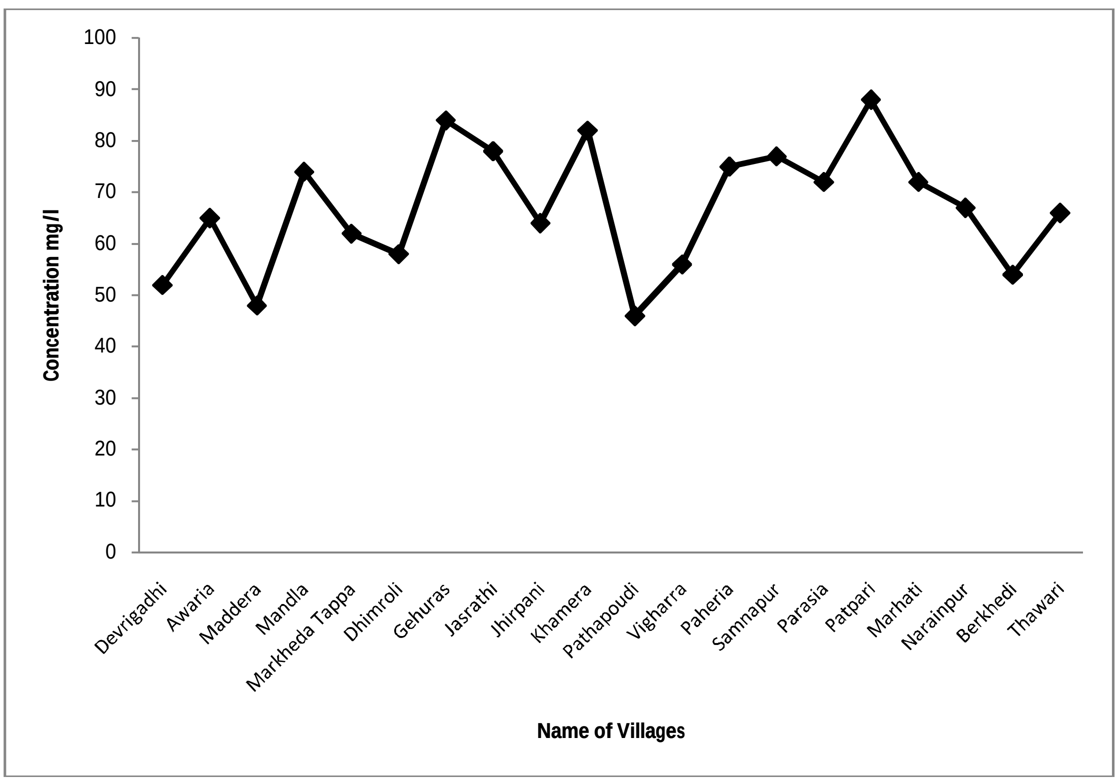

Figure 5: Showing Variation of Nitrate

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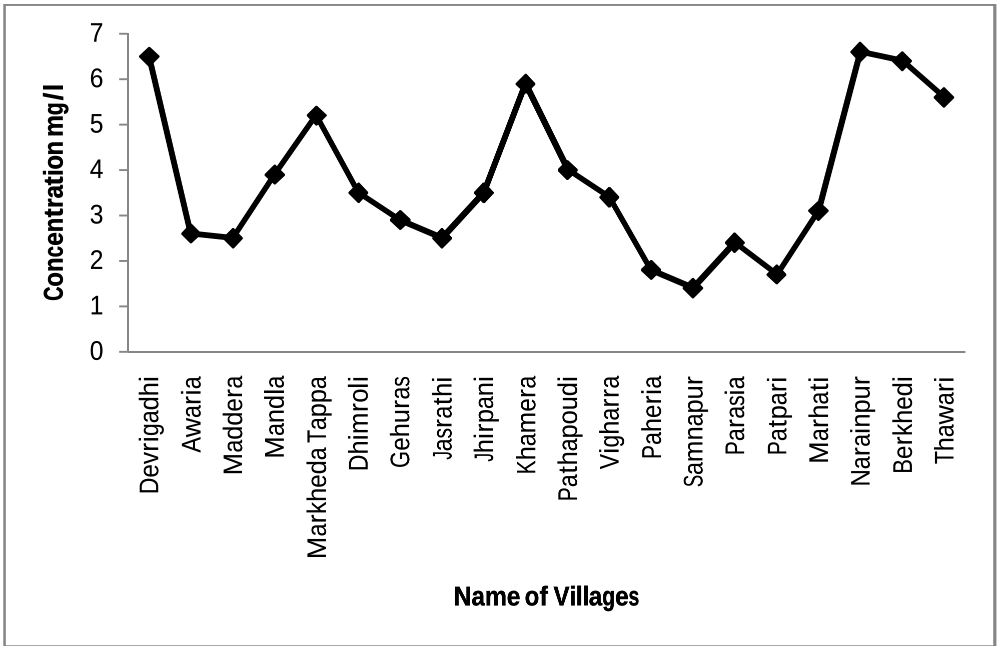

Figure 6: Showing Variation of Fluoride

CONCLUSION

In the investigated area the concentration of calcium, magnesium, iron, manganese is high but not in alarming situation. Lead is toxic metal ion and its concentration should be controlled. Abrupt use of lead should be prohibited. As the drilling depth for Groundwater is increased, the water table is contaminated more by dissolution of rocks ions. The nitrate contamination is totally anthropogenic. Hence controlled use of insecticide, pesticide should be adopted and it must be replaced gradually by organic manure and Organic Farming. High fluoride concentration is matter of concern. Hence these tubewells/ borewells should be sealed and water should be treated before using for domestic purpose. To overcome the problem of fluoride contamination various methods and techniques are developed. Broadly these can be categorized based on their application for commercial level or domestic level. Some methods are : (1) By Activated alumina[17] (2) Reverse Osmosis (3) Electrodialysis Reversal. In some areas fluoride contamination is increasing day by day. It is the high time to think over it and seriously concern about it. We have already exploited the nature. Utmost care should be taken to keep vigilance eye on drilling depth. Where there is no probability of finding water table, the site should be abandoned. Some other site should be selected under the guidance of Hydrogeologist. Puddledytes, serial headup should be developed on natural effluent of the area, thus influencing the water table of the area. In this context rainwater harvesting should also be promoted. Deeptank, soakpit should be made to obstruct the runoff or flowing water.

Foremost task before us is now to enhance and induce rechanrgement process. It can be performed simply by digging artificial structure or by increasing the depth of natural water bodies, which can obstruct or confine surface water for a time period, then transmit and percolate in the subsurface layer.

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