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IDENTIFICATION OF CONTAMINATION IN GROUNDWATER

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Abstract: *The crucial role groundwater plays as a decentralized source of drinking water for millions rural and urban families cannot be overstated. According to some estimates, it accounts for nearly 80 per cent of the rural domestic water needs, and 50 per cent of the urban water needs in India. Groundwater contains some impurities, even if it is unaffected by human activities. The types and concentrations of natural impurities depend on the nature of the geological material through which the groundwater moves and the quality of the recharge water. Residential wastewater systems can be a source of many categories of contaminants, including bacteria, viruses, nitrates from human waste, and organic compounds. This study is for contaminations of groundwater from residential area near village Bodhad in Yavatmal ,1.Radhakrushna Nagari and 2.Gokul Nagari. samples collected are from existing bores which are used for domestic purposes the various tests carried out by using portable digital water/soil analysis kit and also used analytical method for DO concentration , hardness of water and chloride content in water. The water which is used for drinking purpose was safe to use.from various tests it is concluded that PH ,TDS ,Fluoride,chloride content,conductivity are within permissible limit. Only D.O. is slightly less. But it is concluded that the water is safe to use for drinking purpose.*

Keywords: Text extraction, Optimal Code Recognization, Canny Edge Detection, XML

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INTRODUCTION

Natural : Groundwater contains some impurities, even if it is unaffected by human activities. The types and concentrations of natural impurities depend on the nature of the geological material through which the groundwater moves and the quality of the recharge water. Groundwater moving through sedimentary rocks and soils may pick up a wide range of compounds such as TDS, Corides ,fluoride Some aquifers have high natural concentration of dissolved constituents. The effect of these natural sources of contamination on groundwater quality depends on the type of contaminant and its concentrations.

Agricultural: Pesticides, fertilizers, herbicides and animal waste are agricultural sources of groundwater contamination. The agricultural contamination sources are varied and numerous: spillage of fertilizers and pesticides during handling, runoff from the loading and washing of pesticide sprayers or other application equipment, using chemicals uphill from or within a few hundred feet of a well. Agricultural land that lacks sufficient drainage is considered by many farmers to be lost income land. So they may install drain tiles or drainage wells to make the land more productive. The drainage well then serves as a direct conduit to groundwater for agricultural wastes which are washed down with the runoff.Storage of agricultural chemicals near conduits to groundwater, such as open and abandoned wells, sink holes, or surface depressions where ponded water is likely to accumulate. Contamination may also occur when chemicals are stored in uncovered areas, unprotected from wind and rain, or are stored in locations where the groundwater flows from the direction of the chemical storage to the well.

Industrial: Manufacturing and service industries have high demands for cooling water, processing water and water for cleaning purposes. Groundwater pollution occurs when used water is returned to the hydrological cycle. Modern economic activity requires transportation and storage of material used in manufacturing, processing, and construction. Along the way, some of this material can be lost through spillage, leakage, or improper handling. The disposal of wastes associated with the above activities contributes to another source of groundwater contamination. Some businesses, usually without access to sewer systems, rely on shallow underground disposal. They use cesspools or dry holes, or send the wastewater into septic tanks. Any of these forms of disposal can lead to contamination of underground sources of drinking water. Dry holes and cesspools introduce wastes directly into the ground. Septic systems cannot treat industrial wastes. Wastewater disposal practices of certain types of businesses, such as automobile service stations, dry cleaners, electrical component or machine manufacturers, photo processors, and metal platters or fabricators are of particular concern because the waste they generate is likely to contain toxic chemicals. Other industrial sources of contamination include cleaning off holding tanks or spraying equipment on the open ground,

disposing of waste in septic systems or dry wells, and storing hazardous materials in uncovered areas or in areas that do not have pads with drains or catchment basins. Underground and above ground storage tanks holding petroleum products, acids, solvents and chemicals can develop leaks from corrosion, defects, improper installation, or mechanical failure of the pipes and fittings. Mining of fuel and non-fuel minerals can create many opportunities for groundwater contamination. The problems stem from the mining process itself, disposal of wastes, and processing of the ores and the wastes it creates.

Residential: Residential wastewater systems can be a source of many categories of contaminants, including bacteria, viruses, nitrates from human waste, and organic compounds. Injection wells used for domestic wastewater disposal (septic systems, cesspools, drainage wells for storm water runoff, groundwater recharge wells) are of particular concern to groundwater quality if located close to drinking water wells. Improperly storing or disposing of household chemicals such as paints, synthetic detergents, solvents, oils, medicines, disinfectants, pool chemicals, pesticides, batteries, gasoline and diesel fuel can lead to groundwater contamination. When stored in garages or basements with floor drains, spills and flooding may introduce such contaminants into the groundwater. When thrown in the household trash, the products will eventually be carried into the groundwater because community landfills are not equipped to handle hazardous materials. Similarly, wastes dumped or buried in the ground can contaminate the soil and leach into the groundwater.

Properties of groundwater

Composition: The geological nature of the soil determines the chemical composition of the groundwater. Water is constantly in contact with the ground in which it stagnates or circulates, so equilibrium develops between the composition of the soil and that of the water: i.e. water that circulates in a sandy or granitic substratum is acidic and has a few minerals. Water that circulates in limestone contains bicarbonates alkalinity.

Study Area

The area selected will be the residential aera of Radhakrushnanagari (type A,B,C,D) and Gokul Nagari ,Lohara,Yavatmal. Nearly 40 to 50 acres of area is included.The area of having rocky soil by which the groundwater level will be upto the depth of 350 feet.

Methodology

Samples were collected from Radhakrushna nagari & Gokul Nagari and the samples collected are from existing bores which are used for domestic purposes the various tests carried out by using portable digital water/soil analysis kit and also used analytical method for DO concentration , hardness of water and chloride content in water.

Following tests are carried out

1. Temperature

2. Taste and odour
3. pH
4. TDS
5. Conductivity
6. DO
7. Chloride content

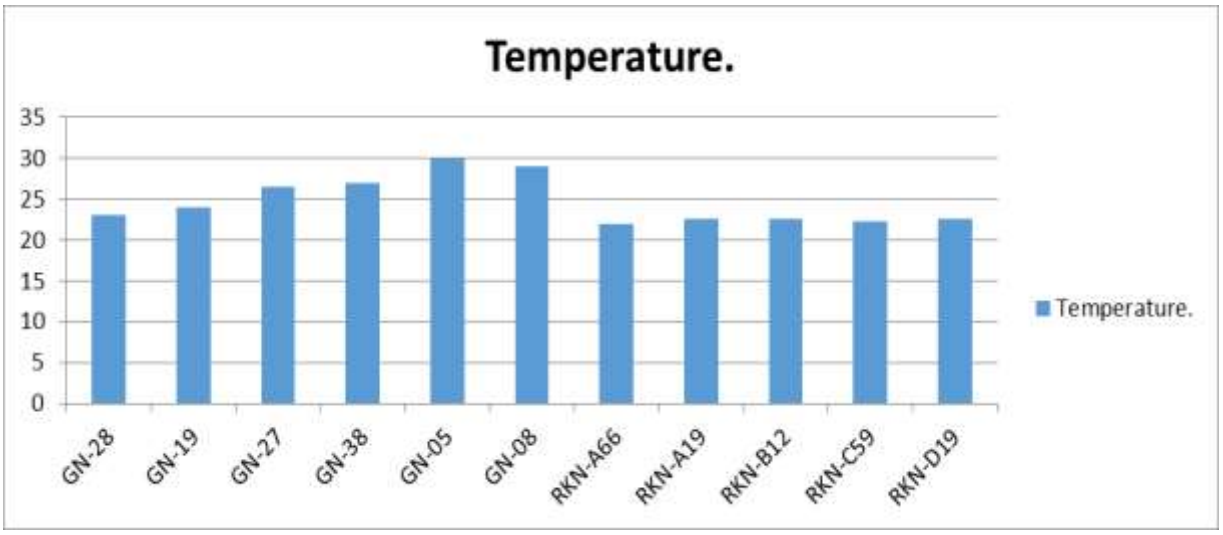
Sampling

Samples are collected from existing bores the details of samples are as follows,

Sr.No.	Name of owner	Bore code	Month & year of drilling	Depth at which water found	Dry /Month &	Month of recuperation	Whether use drinking purpose.
1	Mr.Nawale	GN-28	May-08	Total dep.-180 feet	April	July	Yes
2	Mr.Chandekar	GN-27	May-12	Total dep.-100 feet water -40f	May	July	Yes
3	Mr.Khasane	GN-19	May-12	Total dep.-400 feet	Jan	Aug.	Yes
4	Mr.Pantawane	GN-38	May-12	Total dep.-350 feet	May	July	Yes
5	Mr.Aagashe	GN -08	May-11	Total dep.-300 feet	April	Aug.	Yes
6	Mr.Wani	RKN-A-66	Nov.-13	Total dep.-200 feet	May	July	Yes
7	Mr.Raut	RKN-A-19	Dec.-13	Total dep.-180 feet	May	July	Yes
8	Mr.Kharokar	RKN-C-59	May.-06	Total dep.-250 feet	May	July	Yes
9	Mr.Mahalle	RKN-D-20	Apr-08	Total dep.-125 feet	May	July	Yes
10	Mr.Rangari	RKN-B-12	Apr-10	Total dep.-150 feet	May	July	Yes
11	Society	GN-05	May.-06	Total dep.-300 feet	Jan	Aug.	Yes

Following are the parameters of contaminations

Sr.No.	Sample code	Temp.	Taste & Odour	PH	TDS	Conductivity	D.O.	Cl	Floride	
1	GN-28	23	Unobjectionable	7.83	400	1.2	0.5	36	0.43	
2	GN-19	24	Unobjectionable	7.81	400	0.9	0.7	4.2	0.44	
3	GN-27	26.5	Unobjectionable	7.5	500	1.3	0.9	61.77	0.5	0
4	GN-38	27	Unobjectionable	7.78	400	0.9	0.8	74.5	0.4	0
5	GN-05	30	Unobjectionable	7.84	300	0.7	0.6	39.05	0.95	
6	GN-08	29	Unobjectionable	8.09	400	0.9	0.9	91.62	0.96	
7	RKN-A/66	22	Unobjectionable	8.5	600	1.3	1.1	72.33	0.89	1
8	RKN-A/19	22.6	Unobjectionable	7.3	600	1.3	0.9	70.3	0.98	
9	RKN-B/12	22.6	Unobjectionable	7.5	520	1.1	0.5	68	0.94	
10	RKN-C/59	22.3	Unobjectionable	7.81	400	0.9	1.1	69.2	0.93	
11	RKN-D/20	22.6	Unobjectionable	7.3	600	1.3	0.9	72	0.94	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RKN-A66
RKN-A19
RKN-B12
RKN-C59
RKN-D19
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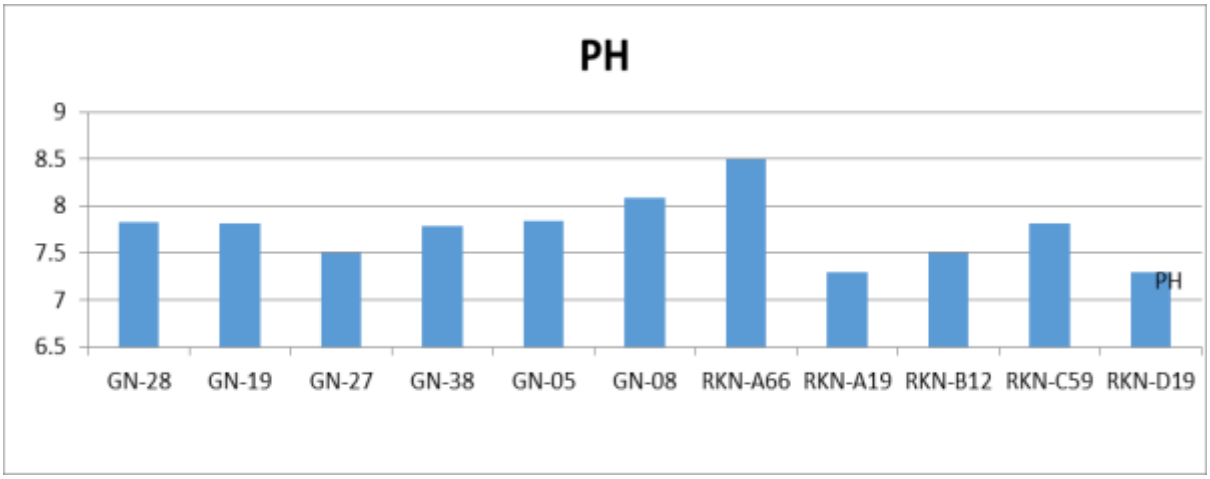
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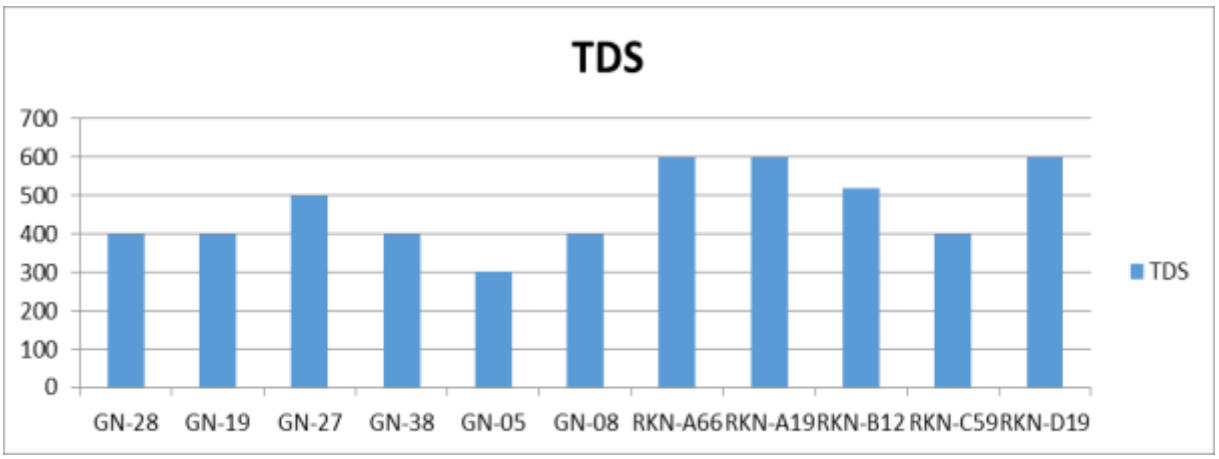

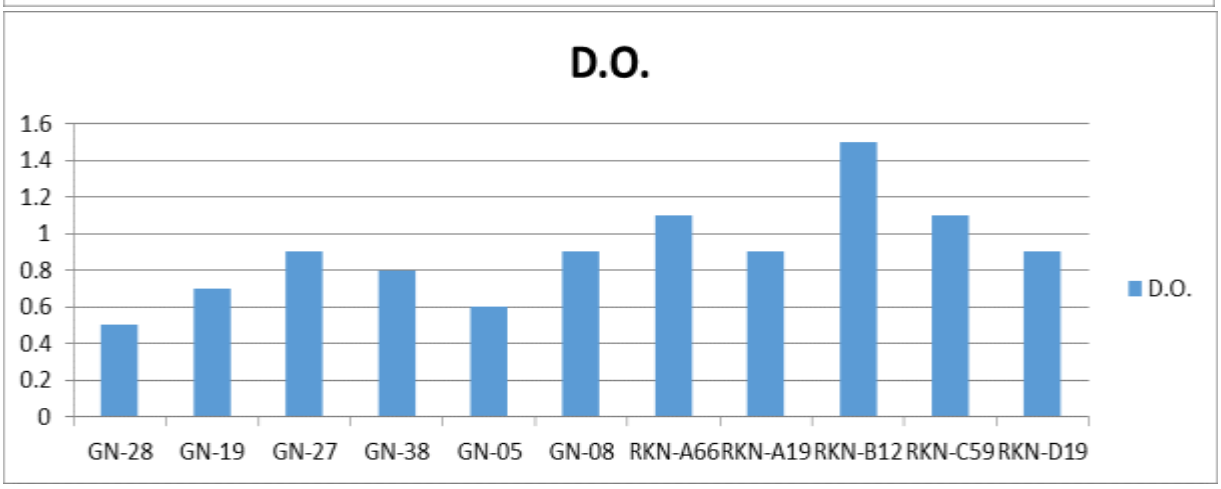

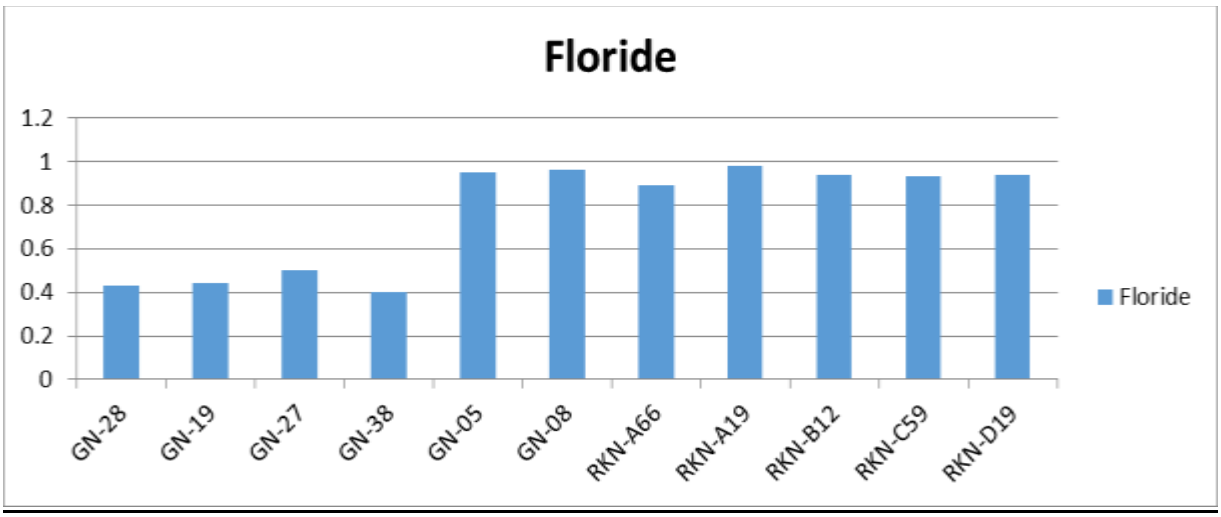

Issues in Tackling Groundwater Contamination and Pollution

It is generating reliable and accurate information through water quality monitoring (WQM) to understand the actual source/cause, type and level of contamination. However, there are a few

observation stations in the country that cover all the essential parameters for water quality and hence the data obtained are not decisive on the water quality status. Secondly, WQM involve expensive and sophisticated equipments that are difficult to operate and maintain and require substantial expertise in collecting, analyzing and managing data. Since water technology is still not advanced in India, it is very likely that the available data is less reliable. The existing methodology for WQM is inadequate to identify the various sources of pollution. Integration of data on water quality with data on water supplies, which is very important from the point of view of assessing water availability for meeting various social, economic and environmental objectives, is hardly done. And finally, in the absence of any stringent norms on water quality testing, results can change across agencies depending on sampling procedure, time of testing, and testing instruments and procedure .Groundwater contamination most often occurs due to geo-hydro chemical processes activated by pumping. Once contamination starts, very little can be done to check it except a total ban on pumping. But this is very difficult, as millions of rural families in India depend on groundwater for sustaining irrigated agriculture and livelihoods. Any legal/regulatory interventions to ban pumping would mean depriving communities of their traditional rights. Though de jure rights in groundwater are not clear, land owners enjoy de facto right to extract groundwater under their land. While nitrate pollution can be properly controlled through following recommended dosage of fertilizers, crop rotation, proper timing of fertilizer application, and use of organic manure instead of chemical fertilizers, there are no institutional regimes governing fertilizer use and dumping of animal waste

CONCLUSIONS :-

Preventive and curative measures against pollution and contamination of groundwater may continue to receive low priority for years to come, and technological measures to prevent the ill effects on human health will get priority in short term. Demineralization using RO system can remove all hazardous impurities from drinking water and would be cost effective in many situations where TDS, nitrate and fluoride in groundwater are above permissible levels. The cost of demineralization is falling rapidly. To operate and manage water treatment systems, making people pay for treated water and building knowledge and awareness among communities about groundwater quality issues and treatment measures. For the long run, policies need to be focused on building scientific capabilities of line agencies concerned with WQM, water supplies, and pollution control; and restructuring them to perform WQM and enforcement of pollution control norms effectively and to enable them implement environmental management projects.

This study is for contaminations of groundwater from residential area near village Bodhad in Yavatmal ,1.Radhakrushna Nagari and 2.Gokul Nagari. samples collected are from existing bores which are used for domestic purposes the various tests carried out by using portable digital water/soil analysis kit and also used analytical method for DO concentration , hardness of water and chloride content in water. The water which is used for drinking purpose was safe to use from various tests it is concluded that PH ,TDS ,Fluoride, chloride content, conductivity are within permissible limit. Only D.O. is slightly less. But it is concluded that the water is safe to use for drinking.

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