Similar Assesment of Water Quality of Ground Water and Sujala Pathakam Filter Plants Installed in the Gudibanda and Rolla Mandala, Madakasira Taluk in Andhra Pradesh

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Abstract— **The target of the paper was centered around the correlation of water from Sujala pathakam plant with the ground water of Madakasira taluk (Gudibanda and Rolla Mandalam) in Andhra Pradesh. The examples were gathered from Sujala pathakam plant and ground water of encompassing regions Gudibanda and Rolla Mandalay and were broken down. The investigation comprised of examination on PH, Conductivity, Alkalinity, Salinity, Total Dissolved Solids (TDS), Calcium, Chlorine, Magnesium and Total hardness. In any case, the general examination demonstrated that the some water test isn't appropriate for the drinking water models given by ISD (1991).Therefore, we can state that the separated drinking water isn't reasonable for drinking.**

Index Terms— **Rural areas, ground water, Sujala pathakam plant, alkalinity, salinity, TDS, pH**

I. INTRODUCTION

What is common to many is taken least care of, for all men (sic.) have greater regard for what is their own than what they possess in common with others.' (Attributed to Aristotle).

Groundwater is the water that exists underneath the surface of the ground in the spaces between particles of rock or soil, or in the cleft and splits in rocks. Most ground water is inside 100 meters of the surface of the Earth. Groundwater can contain numerous constituents including microorganisms, gases, inorganic and natural materials. Mechanical and agrarian exercises are real wellsprings of tainting. Groundwater contamination regularly results from inappropriate transfer of squanders ashore. These exercises can prompt polluting of well water, metropolitan drinking water sources and the environment.

Most of our water assets are bit by bit getting to be contaminated because of the expansion of remote materials from the surroundings. Water quality is surely influenced by the amount and nature of provisions originating from various sources. Water borne diseases are the number one cause of deaths worldwide, with WHO and CDC (The Centers for Disease Control and Prevention) estimates pinning 3.5 million deaths every year to contaminated drinking water.

In India alone, around 2,000 people die every day due to lack of clean drinking water, and out of these, children under the age of five are most vulnerable.The term water potability was created to give a sign of how reasonable the water is for human utilization. Water filters expel pollutions from water by methods for a fine physical boundary. The analysis was to resolve the comparison of filtered water and Ground water, which was taken and were tested. The analysis consisted of examination on PH, Conductivity, Alkalinity, Salinity, Total Dissolved Solids (TDS), Calcium, Chlorine, Magnesium and Total hardness. The examination was conducted on 12 samples collected from Gudibanda and Rolla Mandalam of Madaksira, A.P. The test showed that the potability of the samples of ground water is much potable than the filtered water of Sujalapathakam.

2. MATERIALS AND METHODS

Twelve water samples were collected from Madaksira taluk. Those twelve samples consisted of two from Sujalapathakam (filtered water) and nine samples from the surrounding ground water of Gudibanda and Rolla Mandalam. Those samples were namely, 1,2,11-Byrepalli, 3-PCGiri, 4-CCGiri, 5,6-MSThanda, 7-Gudibanda, 8-Rolla, 9,10-MandalaPalli, 12- MallinaMadagu gate. From the above samples 4A and 4B samples are from Sujalapathakam. Samples were collected in a proclaimed plastic polyethylene bottle of 2 litre capacity for physicochemical analysis prior to sampling, all the sampling containers were washed and rinsed thoroughly with the groundwater. All the chemicals and reagents used were of analytical grade. Double distilled water was used for the preparation of solutions. All the samples were analyzed for PH, Conductivity, Alkalinity, Salinity, Total Dissolved Solids (TDS), Calcium, Chlorine, Magnesium and Total hardness. The pH value ranged from 5.3-7.83, Conductivity from 0.01-0.88, Alkalinityfrom 100-750, Salinity from 0.03-0.6, TDS from 0.01-0.6, Calcium from 120.24-1202.4, Chlorine from 177-672, Magnesium from 2.518-159.18, Total hardness from150-550. Alkalinity, Calcium, Chlorine, Magnesium and Total hardness were tested by titration method and pH, Conductivity, Salinity, TDS by Elecho- water analysis kit.

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Table 1: pH, Conductivity, Total Dissolved Solid, Chloride, Calcium, Magnisium, Total Hardness and alkalinity of samples

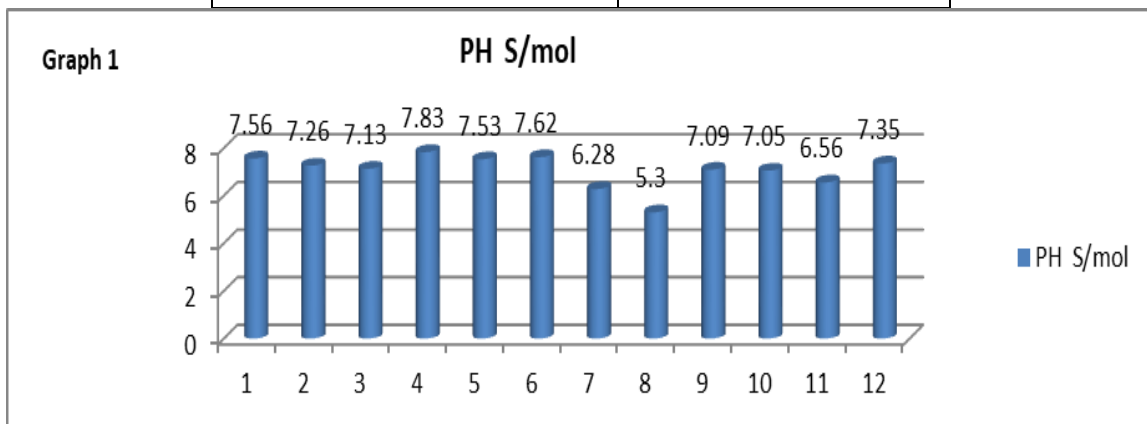|	pH S/Mol	Cond. mosh/cm^3	Salin-ity ppt	TDS mg/l	Cl$^-$ ppt	Ca^{2+} ppm	Mg^{2+} ppm	TH mg/l	Alk mg/l
Min.	5.3	0.01	0.03	0.01	177	120.2	2.518	150	100
Max.	7.83	0.88	0.6	0.6	672	1202	159.18	550	750
Average	7.046667	0.533	0.4144	0.429	336.25	504.3	64.8357	357.5	470
STDV	0.148492	0.049	0.2616	0.03536	350.0179	113.4	41.5581	70.711	120.21
ISD	6.5 - 8.5	-	-	500-2000	250-1000	75-200	0.1-0.3	300-600	200-600

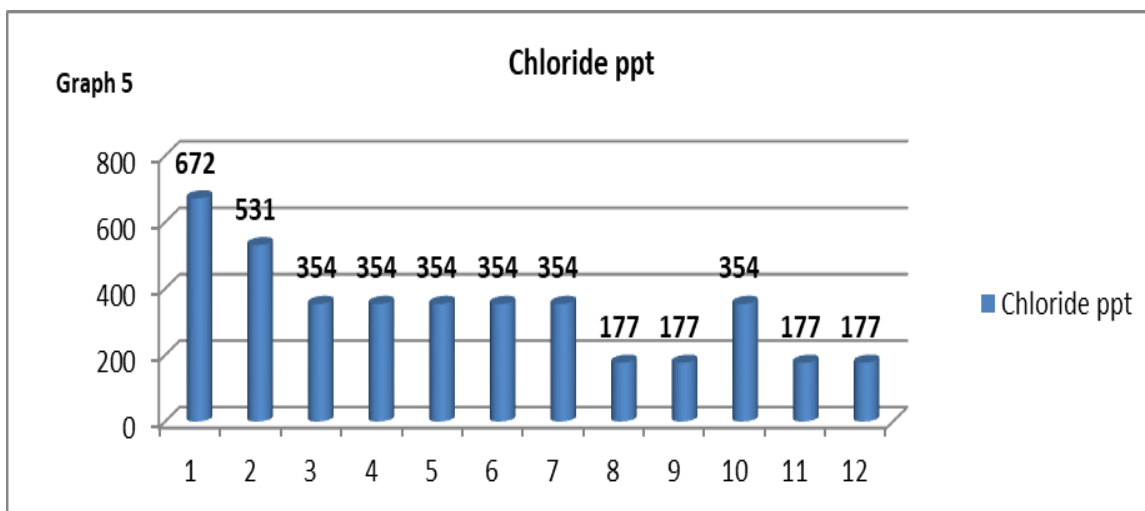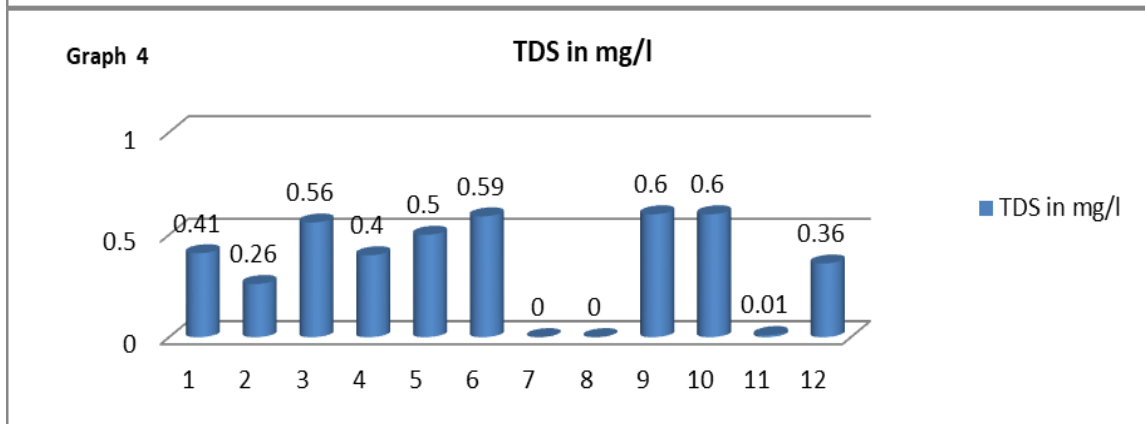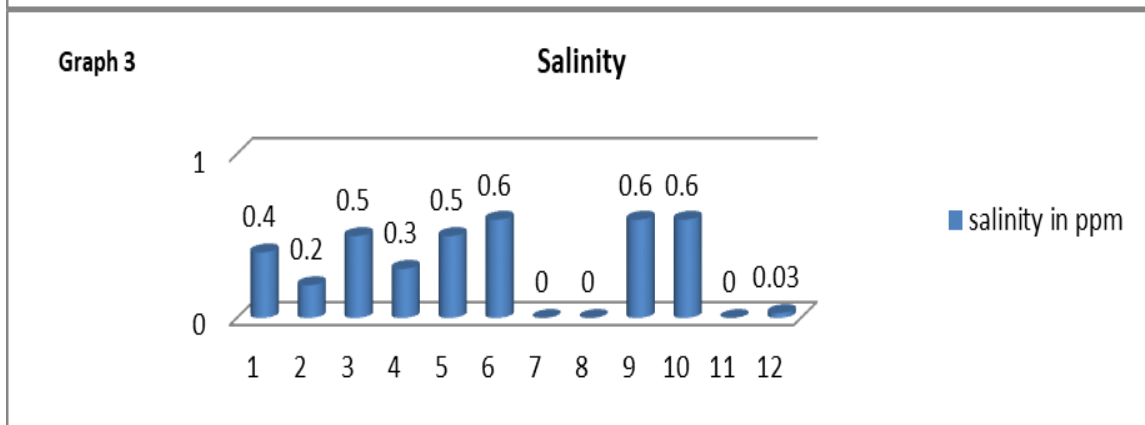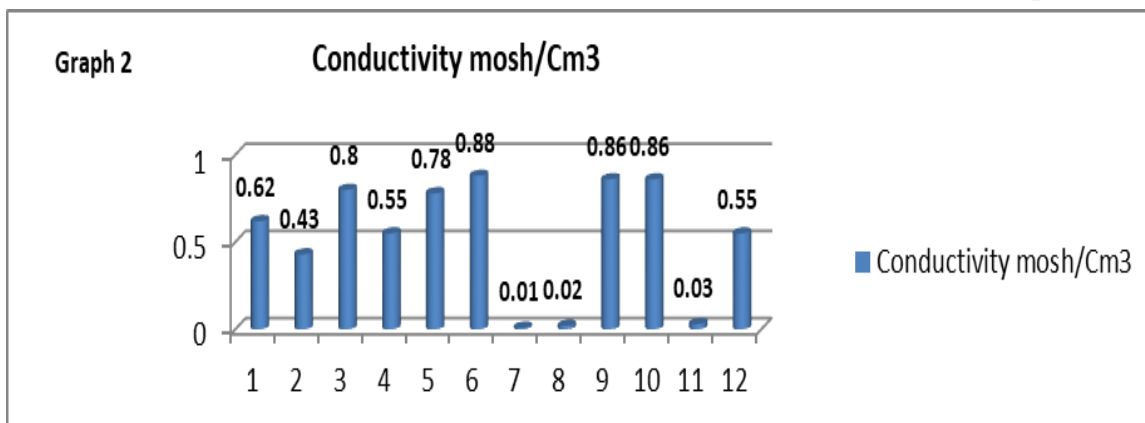Note:1.STDV:Standard deviation; 2.ISD: Indian standards for drinking water
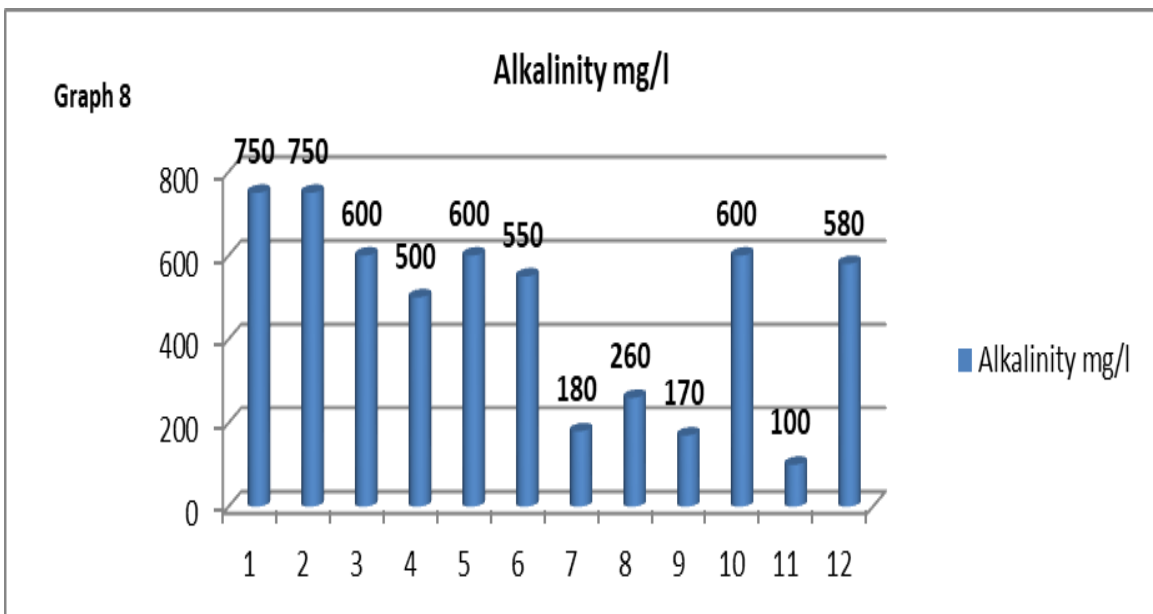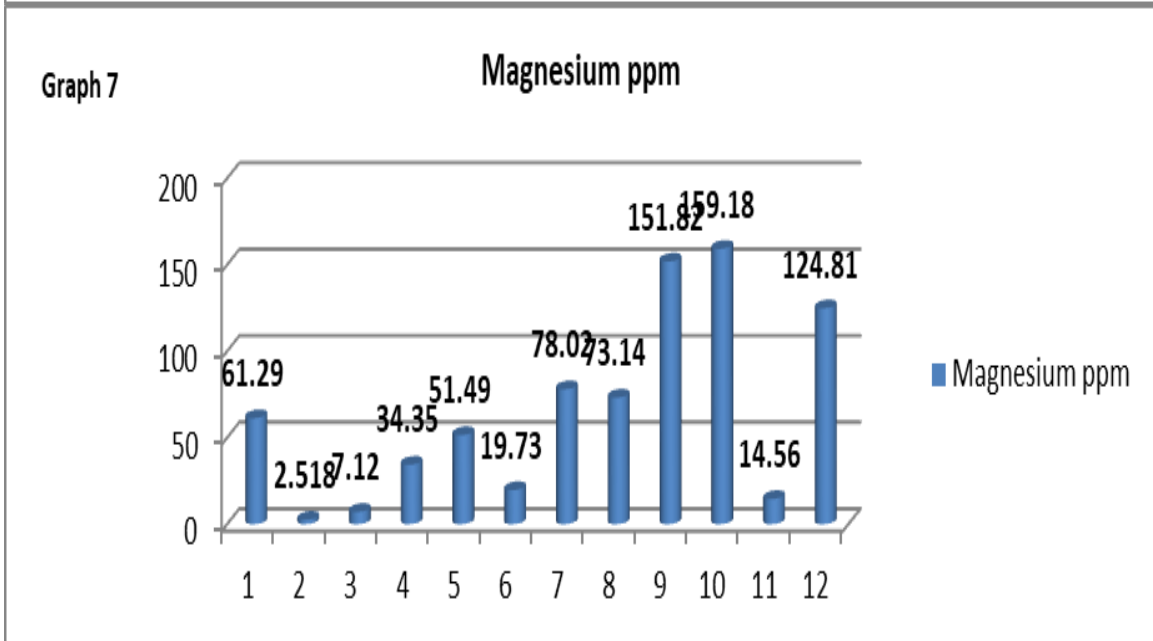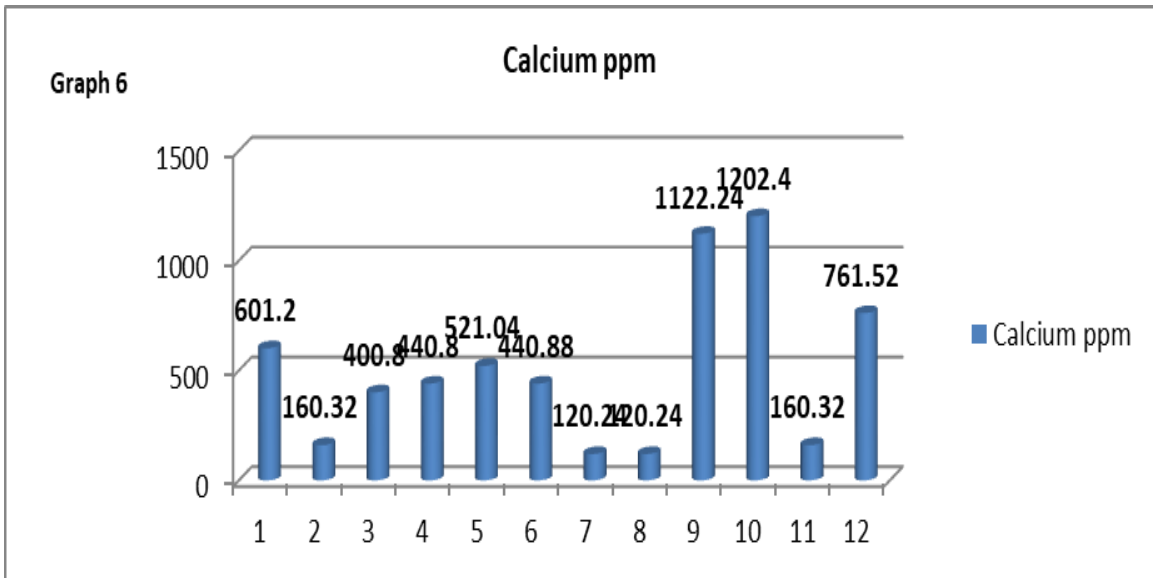
Table 2: Classification of groundwater based on TDS and Hardness

Category	TDS (mg/l)	Hardness of CaCO3 (mg/l)	Water Class
Fresh water	0- 1,000	0 – 75	Soft
Brackish water	1,000- 10,000	75 – 150	Moderately hard
Saline water	10,000- 100,000	150-300	Hard
Brine water	> 100,000	> 300 Very hard	Very hard

Table 3: Classification of groundwater based on pH

Type of water	pH level
Tap water	Varies; typically about 7.5
Distilled reverse osmosis water	5 to 7
Common bottled waters	6.5 to 7.5
Bottled waters labeled as alkaline	8 to 9
Ocean water	About 8
Acid rain	5 to 5.5

Graph 1

Graph 2 — Conductivity mosh/Cm3

Graph 3 — Salinity

Graph 4 — TDS in mg/l

Graph 5 — Chloride ppt

Graph 6

Calcium ppm

Graph 7

Magnesium ppm

Graph 8

Alkalinity mg/l

Graph 9 — Total Hardness mg/l
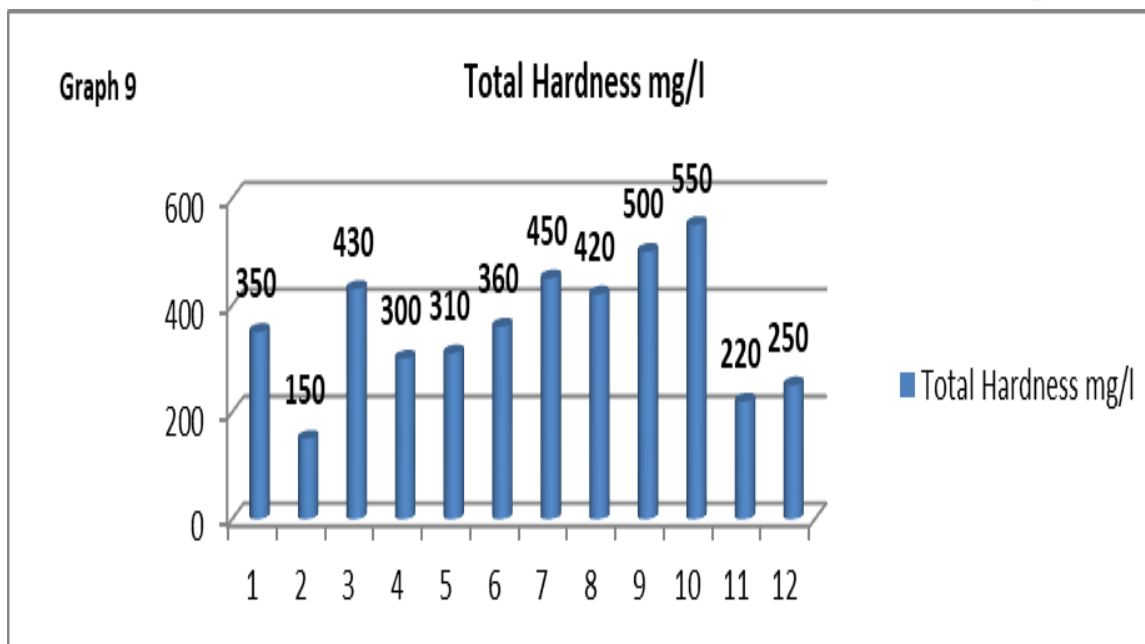
3. ANALYSIS AND OBSERVATIONS

Various physico - chemical properties such as on PH, Conductivity, Alkalinity, Salinity, Total Dissolved Solids (TDS), Calcium, Chlorine, Magnesium and Total hardness were tested. The overall analysis showed that the pH ranged from 5.3 -7.83, Conductivity ranged from 0.01-0.88, Salinity ranged from 0.03-0.6,TDS ranged from 0.01-0.6, Chlorine ranged from 177-672, Calcium ranged from 120.2-1202, Magnesium ranged from 2.518-159.18, Total hardness ranged from 150-550, 75% of the samples were found that hard, it was clear that Sujalapatakam filter water or filters instald were working in good condition.

Alkalinity ranged from 100-750 as we focus on the water of Sujalapathakam samples (7,8) showed that the parameters are within the limit given by Indian standards of drinking water. The pH of drinking water is not a health concern, however, acidic water (low pH) can leach metals from plumbing systems, which can cause health problems. The pH is of importance in determining the corrosivity of water, but the relationship with a number of other parameters is complex. Natural waters contain gases, colloidal matter and a variety of electrolyte and non-electrolyte material, and these, together with pH, determine the extent of corrosion in a system. However, in general, the lower the pH, the higher the potential level of corrosion(7,8).

Hardness of water was originally taken to be the capacity of a water to destroy the lather of soap, hardness was determined formerly by titration with soap solution. Nowadays, the analysis comprises the determination of calcium and magnesium, which are the main constituents of hardness. Although barium, strontium and iron can also contribute to hardness, their concentrations are normally so low in this context that they can be ignored. Thus, total hardness is taken to comprise the calcium and magnesium concentrations expressed as mg/l CaCO3. The widespread abundance of these metals in rock formations leads often to very considerable hardness levels in surface and ground waters.(2,4)

Since the beginning of time, water has been both praised and blamed for good health and human ills. We now know the real functions of water in the human body are to serve as a solvent and medium for the transport of nutrients and wastes to and from cells throughout the body, a regulator of temperature, a lubricator of joints and other tissues, and a participant in our body's biochemical reactions. It is the H_2O in water and not the dissolved and suspended minerals and other constituents that carry out these functions. TDS is a measure of the combined content of all inorganic and organic matter which is found in solution in water. Water low in TDS is defined in this paper as that containing between 1-100 milligrams per liter (mg/L) of TDS. This is a typical type of water quality obtained from distillation, reverse osmosis, and deionization point-of-use water treatment of public or private water supplies that are generally available to consumers in the world.

Worldwide, there are no agencies having scientific data to support that drinking water with low TDS will have adverse health effects. There is a recommendation regarding high TDS, which is to drink water with less than 500mg/L. Some people speculate that drinking highly purified water, treated by distillation, reverse osmosis, or deionization, 'leaches' minerals from the body and thus causes mineral deficiencies with subsequent ill health effects (10).

Calcium is available in the water normally, they may result from the draining of soil and other characteristic sources, yet the expansion of sewage waste may likewise be in charge of the expansion in the measure of calcium. Calcium is generally a standout amongst the most essential supporters of hardness. The human body requires around 0.7 to 2.0 grams of calcium every day as a sustenance component, extreme sums can prompt the arrangement of kidney or gallbladder stones. In the present examination, the calcium focuses were observed to be inside the admissible furthest reaches of WHO (75 mg/L).

CONCLUSION

The result obtained during the study was compared with standards and it was found that in most of the cases the parameters were within the desirable limit. This means that this area receives very low amount of pollution from the surrounding and the drinking water of this area is free from contamination. It was shown that the SUJALAPATHAKAM filter plants in this area were maintained properly until our

survey. we suggest that the same survey has to be extended to the panchayaths to monitor the proficiency of the filters.

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