



GROUND WATER ANALYSIS & TREATMENT OF REMOVING HARDNESS BY USING LIMESTONE & NATURAL BEDS

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Abstract

The paper presents the importance and the necessity to remove the hardness of the Ground water. There are presented the methods of treatment of the waters, in order to find the best condition and parameters treatment process. After discussing the concepts Water Resources Management and Cold Climate, the article focuses on freshwater resources in the Arctic and possible impacts of future climate changes on snow, water, ice and permafrost.. In cold regions the challenges are also related to general conditions societies have in common, e.g. sparsely populated, depopulation, long distances between populated areas and difficulties with recruiting right competence, beside the influence of the harsh climate on the technical system .We have used chemical ingredients like Limestone ,alum in the treatment of removing the hardness from the well water and also we have used natural ingredients like Vernacular roots for pleasant smell and Moringa seeds , Strychnos potatorum for increasing the taste of the water.

Keywords Groundwater, Alum ,Limestone, Charcoal, VettiRoot, Moringa Seed, Pebble, P-Sand, Strychnos potatorum

1.INTRODUCTION

The purification of ground water is the most important problem faced by present and future generation. Large amount of waste water polluted which cause large amount of water want to treat. The main reason for water treatment is reuse of water treatment. They are more than 200 natural water treatments plants

in all over the country. There are many methods are developed for water treatment but some methods require high cost and large area.

Instead of chemical methods, natural methods has some advantage. They are,

- It require low labour and area so cost low.
- It require low maintenance.
- High efficiency to climatic conditions.
- Simplicity in process and equipment.

By natural methods micro organisms, turbidity, bad smell are removed and it give good smell and taste. Treatment of waste water also used to avoid wastage of drinkable water for domestic usage such as gardening, bathing, clothes and vessel washing etc. Followings details are according this study.

1.1 OBJECTIVE

- Study of natural materials which used in water treatments.
- Improve the quality of water by using easily available natural material without using any chemicals .
- For the specify some water parameters between ground water and processed water.
- Major goal of the study was to increase the water quality and smell by natural beds.
- Lime stone was used to remove hardness of water .

1.2 SCOPE OF OUR PROJECT.

- Avoid any using chemicals and chemical smell in water.

- Adding some nutrients to water which contain by some materials like charcoal, vetiver, moringa seeds, strychnos potatorum along natural beds .
- Increase the taste of water.

1.3 METHODOLOGY

- Literature Collection And Study
- Material Collection And Study
- Discussions On Material & Properties
- Testing Of water samples
- Arranging natural beds
- Testing of processed water samples
- Result And Discussions
- Conclusion

2.MATERIAL PROPERTIES

2.1 MATERIAL USED

- Vernacular (Vetti roor)
- Moringa seeds
- Pebbles
- P-sand
- Charcoal
- Lime stone
- Alum
- Strychnos potatorum

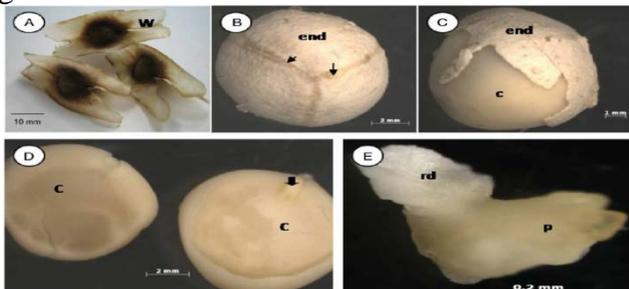
2.1.1 Vernacular

Vetiver is a large tufted bunchgrass and can grow up to 1.5 metres (5 feet) in height. The vetiver grow below in the soil and can reach depths of more than 3 meters . The plant has high very drought resistant



2.1.2 Moringa seeds

Moringa seeds have 40% of oil. It is used to remove suspended particles and Turbidity in groundwater. Moringa seeds will remove 90-99 % micro organism and increase purity of ground water.



2.1.3 Pebbles

Pebbles is used to filter the unwanted particles in ground water during the process. The angular , sub – angular pebbles are used. Brownish colour pebbles well graded prbbles used.



2.1.4 P-Sand

High graded p sand can filter the micro organism ,suspended solids and unwanted agents without using of any chemicals .The solids and other particles are settled on the top of soil bed.



2.1.5 Charcoal

Charcoal contain calcium, magnesium, iron so, it give to the water this minerals and can improve the quality of water. Charcoal can attract the harmful agents in water



2.1.6 Lime stone

Limestone is an alkaline agent which used to neutralize or partially neutralize strong acids. In strong acid groundwater, calcium carbonate react with water and give water, carbon- di-oxide and calcium salts





2.1.7 Alum

Alum is used to clean the water by neutralizing the electrical double layer surrounding very fine suspended particles, allow them to settle. After settlement, the particles can easily remove.



2.1.7 Strychnos potatorum

Strychnos potatorum is used to reduce turbidity in water and give taste to the water.

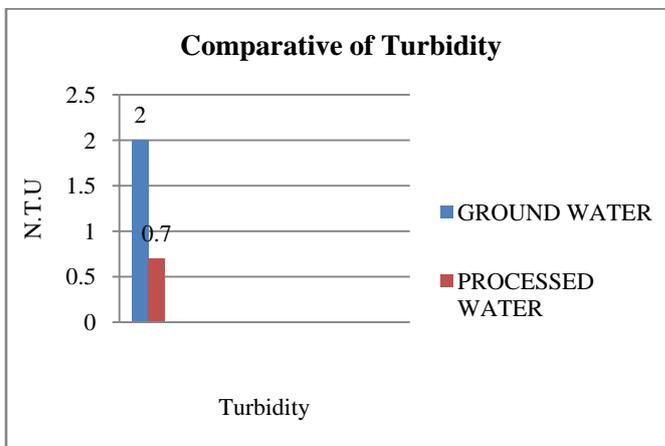
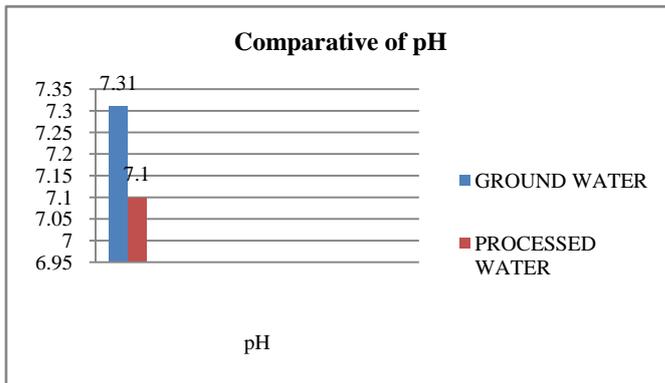


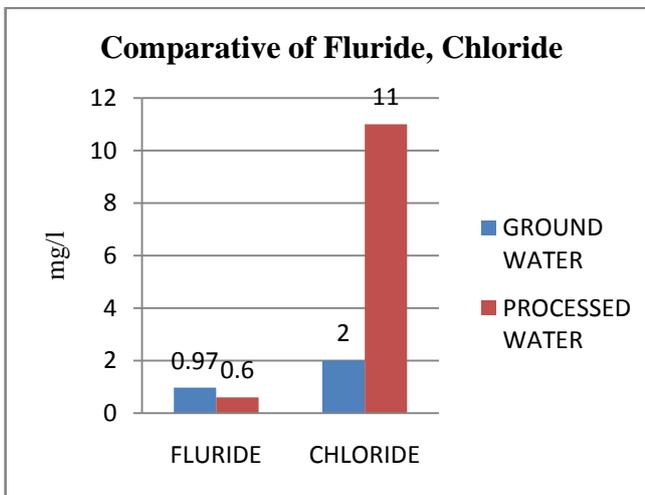
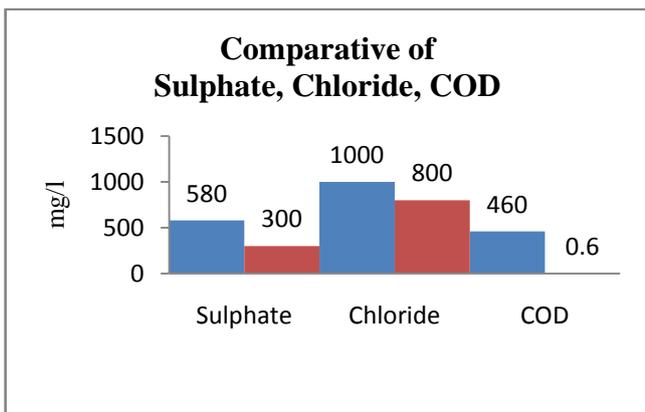
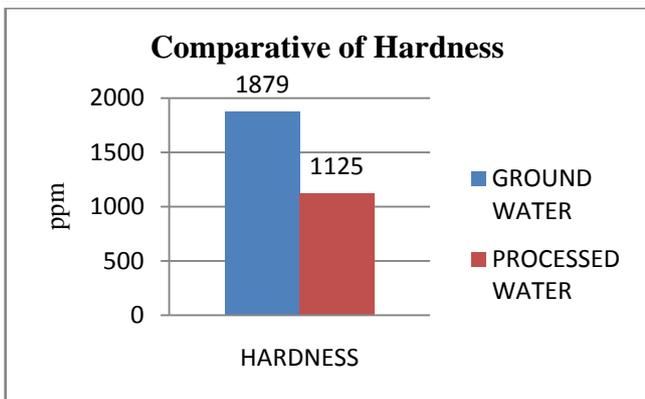
3. TESTING OF GROUND WATER AND PROCESSED WATER SAMPLE

- a) pH Test
- b) Hardness test
- c) Biological oxygen demand test
- d) Chemical oxygen demand test
- e) Sulphate test
- f) Chloride test
- g) Turbidity test
- h) Fluoride test

RESULTS

TESTED PARAMETERS	GROUND WATER	PROCESSED WATER
pH	7.31	7.10
HARDNESS TEST	1879 ppm	1125 ppm
BOD TEST	2 mg/l	11 mg/l
COD TEST	460 mg/l	200 mg/l
SULPHATE TEST	580 mg/l	300 mg/l
TURBIDITY TEST	2 N.T.U	0.7 N.T.U
CHLORIDE TEST	1000 mg/l	800 mg/l
FLUORIDE TEST	0.97 mg/l	0.60 mg/l





4.CONCLUSION

- From the above experimental investigation of the study following conclusions are,
- Using of vetiver gives the pleasant fragrance to the ground water.
- Due to the reaction of alum, the solid particles in groundwater settled and easily removed.

- The turbidity, hardness and pH of ground water is slightly decreases.
- Strychnos potatorum is give taste to the water.
- The treatment of ground water by using lime stone and natural beds give some acceptable results but its not give accurate results.

REFERENCES

- [1] Nicholas p. Cheremisinoff Ph.D., in Groundwater Remediation and Treatment technologies, 1997. (references)
- [2] Abdul Syukor AbdRazak, Norbaizurah Rahman,NorbaizurahRahman,NurAzzimah Zamri, SuryatiSulaiman, Noor AsyikinAisyahBurhanudin, Hasmaniebinti Abdul Halim and EdriyanaAbd Aziz.,COD, BOD and Heavy Metals Remove From Ground Water Treatment By using WASRA System.
- [3] Metcalf and Eddy (1991). Wastewater Engineering. Treatment Disposal Reuse, G. Tchobanoglous and F.L. Burton (Eds.), 1820 pp. New York: McGraw-Hill.
- [4] Review on Natural methods for waste water treatmenr, Ashwani kumar Dubeyand Omprakash sahu .
- [5] Tradional use of vetiver, Journal of Medicinal plants studies.
- [6] Siriprapha J, Sinchai K, Suwapee T, Harit K, Tongchai S (2011). Evaluation of reusing alum sludge for the coagulation of industrial wastewater containing mixed anionic surfactants. J. Environ. Sci. 23(4):587–594].
- [7] Hsu WM, Hseu ZY (2011). Rehabilitation of a sandy soil with aluminium-water treatment residual.
- [8] Removal of Hardness from Water samples by Corbonation process with a Closed pressure Reactor.
- [9] Water Hardness removal By coconut shell activated carbonin East Asian Science Technology and Society an International Journal 2(5);97-102, August 2014