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Hydrological Studies of the Groundwater Quality in the Chosen five Taluks of Perambalur District in Tamilnadu, India

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ABSTRACT

The present study deals with the Hydrological Studies of ground water quality with respect to few taluk in Perambalur district which is situated south east of Tamilnadu, India. Fifteen groundwater samples were collected from different locations covering open wells as well as tube wells for determining various parameters (EC, pH, TDS, F-, Cl-, Na+, Ca2+ and Mg2+,Nitrate,Nitrite, Iron). The Physical Parameter of odour showed clear appearance in all water samples. The obtained results were compared with National (TNPCB) and international permissible limits (WHO). This study indicates that all the water samples are potable. The physical and chemical parameters are within the permissible limits.

KEYWORDS : Hydrological Studies, Ground Water Quality, TNPCB, WHO

INTRODUCTION

In rural areas, villages face the scarcity of drinking water mostly every summer. They suffer an acute shortage of drinking water due to excessive dose of iron, manganese, chloride, sulphates, total dissolved solids, hardness, alkalinity or acidity. Water is said to be contaminated when it contains parasitic agents, poisonous chemical substances, industrial or domestic wastes. Hague and sharm (1980) reported that India 50% of diseases are water borne. According to a report of WHO 25,000 people die every year in the world either by shortage of by waters the use of polluted water.

The septic tank effluents contain carbonaceous and nitrogenous matters in addition to phosphorus and high bacterial population. It pollutes the ground water. The frequent outbreaks of epidemics such as jaundice, dysentery, typhoid fever, cholera, various types of diarrhea and other intestinal pathological disorders are being related to the consumption of these contaminated ground water (Prasad, 1988).

The comparison of the groundwater quality between polluted and non-polluted areas contain high concentrations of dissolved solids alkalinity, hardness, chlorides, COD and MPN index, The quality of water in deep tube wells some of the hand pumps in not within the limits as they contain high values of total dissolved solids, hardness and sulphates. These hard waters may cause deposits of calcium and magnesium salts in the water mains. Many of these reaction known to be catalyzed by microbes that have adopted themselves to extract energy for their sustenance from specific exothermal chemical reactions. In biological systems, osmotic transport of water, selective transport of charged ions through active and passive remembers, and reverse osmosis of ions play major roles (Narashiman, 2005). Plant transpiration also takes a large quantity to soil water evaporation it in to the atmosphere to keep the leaves cool, although plant photosynthesis and transpiration pump the soil ground by changing the climate and inducing precipitation locally (Micro climate). The complex feedback processes involved in plant physiology and climate and its effect in groundwater storage are not well – understood,(Radioman, 2005).

Less than 1 % of water is available for human consumptions and more than 1.2 billion people still have no access to safe drinking water. Over 50% of the worlds population is estimated to be residing in urban areas and almost 50 % of the mega cities having population over 10 million or heavily depended on ground water and all are in developing world (Roy and Shah (2002) an Monarch, (2002). In a many Asian countries there has withdrawals are used for irrigation purpose, FAO, (2003). In many Asian countries there has be raid in agriculture industries in the last three decades.

MATERIALS AND METHODS:

The present studies were under taken in Few Taluk at Perambalur district in TamilNadu, India. This taluk is located in central of TamilNadu. Mainly these area peoples depend monsoon for their agriculture activities. The water sampling stations are selected on the basis of ground water source,. Which are mostly used by the public for domestic and irrigation purposes. The following table – 1 showed sampling places and depth of the ground water level. Water samples were collected in 2 lit. The sampling bottles were thoroughly pre cleaned with 50% HnO^3 followed by triple washing in double distilled water. The water samples were immediately brought to the laboratory for estimation of water quality parameter. Standard methods described for estimation of water quality parameter. Standard methods described for WHO and TNPCB were followed for estimation of the physical and chemical parameters. The Data's were presented and compared with National and international standards.

Results and Discussion

The results of the present systematic study of ground water quality and assessment of environmental parameters (Physical and Chemical) are present in Fig 1 . Out of total 15 samples, were taken from Ayanthathanur, Anganur, Ponparappi, Kallampudur, Kunnam, Paravai, Valajanagaram, Rajeev Nagar, Ariyalur, **Udayarpalayam School, Udayarpalayam Four Road,** Adhichalur, Sangupettai, ThuraiMangalam, Annai Nagar.in few taluk at perambalur district. In general physical and chemical parameters of water samples showed within the limits. In this present study the data revealed that the Rajeev Nagar area water samples are polluted slightly higher. The samples from all the station were colourless and odourless. In general colour and odour are objectionalble. In our presence results alkalinity, total hardness, calcium,nitrate and fluorde values are exceed in the place of Avanthanur, ponparappi, Kunnam. The other places the alkalinity and fluoride nitrite values are exceed to the permissible limt. Over exploitation induce changes in hydrolic head causes inter mixing of contaminated groundwater with of freshwater along specific flow pathway. The same reports also emphasized by Sharma et al., (2005). Das et al., (2003) reports out of a total 235 samples 10.7% has fluoride concentration above 1.5 ppm in our present result also 80% of the places showed above 1 ppm fluoride concentration. This studied brings about a detailed analysis of physical and chemical parameters of the study area. Further it indicates most of places are contaminates the water is unfit for human consumptions, due to this water related diseases are out break frequently in this area. In general, adequate treatment of human and animal waste contributes to the high incidence of water related disease in the country. To date only 14% of rural and 70% the urban in habitants have access to adequate sanitation facilities therefore the water contaminated by human basis discharged directly in to water courses are seeps into the ground water table faulty septic tanks.

CONCLUSION

In the present study the values of electrical conductivity, pH, Total dissolved solids,Choloride, Sulphate, Phosphate, Nitrate, Fluoride, Calcium, Magnesium, Iron become unusable if it becomes polluted and is no longer sage to drink, In areas whereas the materials above the aquifer is permissible, pollutants can seep into groundwater. Groundwater can be polluted fuel tanks, and sometimes fertilizers or pesticides used of farms.

By and larger the groundwater condition scan to be in the normal levels. However it is felt that adequate precautions need to be taken so that further deterioration can avoided as it happens elsewhere. It is also felt that the public need to be given and awareness can be im-

portance of preserving the groundwater quality so that its sustainability and quality maintained.

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Table – 1. Sampling stations and depth of ground water level in Few Taluk

Sl.No	Sampling stations	Types of source	Depth(Feet)
1	Ayanthathanur	Open well	135 Feet
2	Anganur	Hand pump	110 Feet
3	Ponparappi	Open well	90 Feet
4	Kallampudur	Hand pump	70 feet
5	Kunnam	Open well	150 feet
6	Paravai	Open well	150 feet
7	Valajanagaram	Hand pump	50 feet
8	Rajeev Nagar	Open well	100 feet
9	Ariyalur	Open well	85 feet
10	**Udayarpalayam School**	Hand pump	110 feet
11	**Udayarpalayam Four Road**	Hand pump	60 feet
12	Adhichalur	Open well	80 feet
13	Sangupettai	Open well	125 feet
14	ThuraiMangalam	Hand pump	90 feet
15	Annai Nagar	Open well	60 feet

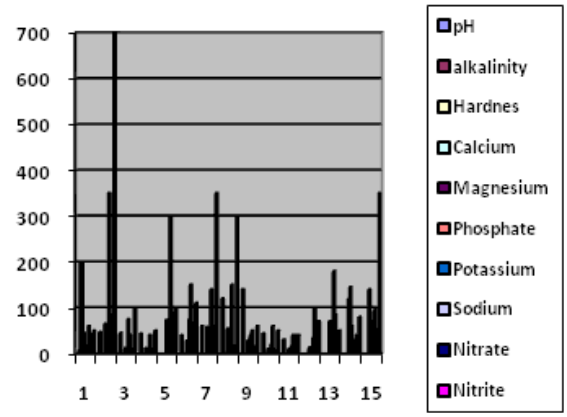

Figure 1. Parameters of groundwater from sampling stations

1. Ayanthathanur,2. Anganur,3. Ponparappi, 4.Kallampudur,5. Kunnam,6. Paravai, 7.Valajanagaram, 8.Rajeev Nagar, 9.Ariyalur, **10.Udayarpalayam School, 11.Udayarpalayam Four Road,** 12.Adhichalur, 13.Sangupettai, 14.ThuraiMangalam, 15.Annai Nagar

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