

RESEARCH PAPER:

Physical and chemical characteristics of groundwater in Kollegal taluk, Chamarajanagar district, Karnataka

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SUMMARY

The quality of groundwater in the kollegal taluk covering an area of 2522 sq km² in Karnataka has been studied based on the composition of 60 bore well water samples. An attempt has been made to classify the groundwater by various methods. According to BIS, 97% of the water samples in the study area are within the desirable to permissible limit. 93% of the samples fall in C2S1 class of USSL diagrams according Wilcox diagram, 91% of samples fall within the excellent to permissible classes. The chemical composition of the groundwater which moves from the recharge area to the discharge area reflects changes by various geochemical process. The relationship between groundwater flow, hydro geologic properties and hydrogeochemistry has been studied by many researchers (Back 1960, Scholler 1962, Domenico 1972, Freeze and Cherry 1979, Ophori and Toth 1989, Domenico and Schwartz 1990, Afsin 1997).

Fresh water is most precious for all living organisms. Availability of safe potable water is still a problems of majority of population. Due to the steady increase in the population, urbanization, deforestation etc., the water resources have been adversely affected both qualitatively and quantitatively. Water pollution is one of the major problems in developing countries like India.

Groundwater is a prime source for drinking and irrigation purposes. However this vital resource is easily liable for pollution due to human inclination to consume more of the groundwater. Underground storage tanks, land fills, abandoned disposal of hazardous waste on land, industrial waste storage tanks, ponds, lagoons have no liners to prevent toxic liquid wastes from seepages (percolations) into the soil. These are the major sources of groundwater contamination, the major soluble effluents percolate and pass through the soil profile into the groundwater aquifers. Further no soil is effective in sieving out the organic/inorganic synthetic wastes disposed by the industries as these affect the soil profile and show deterioration in plant growth. Once groundwater is contaminated, it does not cleanse itself as surface water because groundwater flow is slow and not turbulent. Contaminants are not effectively diluted and dispersed.

MATERIALS AND METHODS

The study area of the Kollegal taluk geographically represented by the 77° 05' to 77° 45' E longitude 11° 45' to 12° 15' N latitude in parts of Chamarajanagar district, Karnataka, India. Groundwater samples were collected from bore wells of from 60 sites. Seven locations were chosen based on the sensitivity of residential, non-residential areas and major anthropogenic affecting areas. The samples were collected randomly in three sampling sites of each location at moderate climatic conditions in 1L pre - acid washed poly propylene cans in the field of selected station, sealed with label together with relevant details and analysed for physico-chemical characteristics like pH, electrical conductivity, total dissolved solids, chlorides, total hardness and nitrates to determine the contamination levels of groundwater in each of the samples. Care was taken to avoid contamination during the analysis of the samples and reagents preparation used since they contribute high blank levels. The concentration of samples including blank were analysed by adopting the standard procedures for water and waste water analysis (APHA 1992).

RESULTS AND DISCUSSION

The characteristics of groundwater samples are presented in Table 1. Percolations

Key words :

Groundwater

quality,

Hydrochemical

facies,

Permissible limit,

USSL diagram

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