

RESEARCH PAPER:

A study on ground water quality in Mangalore city, India

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SUMMARY

Nine groundwater samples were analyzed for pH, dissolved oxygen, alkalinity, solids, hardness, chloride, phosphate, sulphate, calcium, magnesium and iron contents by adopting standard methods. The results were evaluated in accordance with the WHO and BSI standards. pH showed marked increase when compared to the values of twenty years back. In two stations namely, Panamboor and Hoige Bazaar, the pH was above the WHO drinking water standards. The values of DO, alkalinity, solids, hardness, chloride, phosphate, calcium, magnesium and iron in the present study met below the BSI and WHO drinking water standards. The quality of sulphate in all samples except in Konaje and Kavoar was more than the standards prescribed by the BSI and WHO.

Key words :

Ground water,
Dissolved oxygen,
pH, Hardness,
Sulphate

Water is one of the most precious natural resources and is essential for everything on our planet to grow and prosper (Buragohain *et al.*, 2007). 97.2% of world's water is found in oceans and seas and the remaining 2.8% of water is found as ground water and surface water. The volume of ground water (0.59%) is 30 times greater than the surface water (0.02%). Surface water is generally easy and economic to harvest but its availability varies with the season and its use for irrigation frequently brings in its wake problem like water logging. Ground water, on the other hand, is obtained throughout the year. When seen from the country as a whole, there appears to be considerable groundwater available for future development (Raju, 1990). This water is disregarded now by the developmental activities like industrialization, urbanization etc. When water is unfit for its intended use, it is considered as polluted. WHO has given a set of guideline values for drinking water quality (WHO, 2004).

Ground water is the water held in regolith and underlying bedrock between the saturated zones in which all pore spaces are occupied by water (Strahler, 1981). Atmospheric precipitation is the main source of fresh ground water. It is estimated that about 25% of the precipitation becomes groundwater (Nace, 1960). Ground water of atmospheric origin that has been isolated from hydrologic cycle for thousands of years is called meteoric water and that isolated from millions of years is called connate water. Juvenile water or primary water is formed within the earth itself and is arised

from volcanic activity (Guines, 1963). Groundwater is explored by digging the wells. There are three types of wells namely bore well, open well and dug cum bore well (Garg, 1978). The indiscriminate disposal of industrial wastes on mother earth slowly makes the ground water susceptible to pollution (Prakash *et al.*, 2007). Literature on groundwater revealed that the scientific investigation was rarely carried out with regard to the physico-chemical quality of ground water in Mangalore taluk. Hence, the present work is a small effort to give an idea of ground water quality and its usefulness for domestic, industrial, agricultural and other needs in Mangalore city.

MATERIALS AND METHODS

Mangalore city is situated in the southern part of India on the coastal side of Karnataka. It is a fast growing city and has been urbanized and industrialized rapidly during the past 15 years. It harbored the mega industries like Mangalore Chemicals and Fertilizers Ltd. (MCF), Kudremukh Iron Ore Company Ltd. (KIOCL), New Mangalore Port Trust (NMPT), Mangalore Refinery and Petroleum Ltd. (MRPL), Nagarjuna Industrial Thermal Power Plant (NITPP) and several small and medium scale industries in and all around. Since all these industrial establishments have triggered the growth of urban population, transport facilities etc., abatement of pollution of water, air and soil have become a challenging problem in Mangalore city.

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