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**“A COMPARATIVE STUDY OF THE GROUNDWATER QUALITY IN A
SEWERED AND AN UNSEWERED AREA OF MYSORE CITY FOR
NITRATE AND PHOSPHOROUS”**

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Abstract

The utilization of water from ages has led to its over exploitation coupled with the growing population along with improved standard of living as a consequence of technological innovations. The contamination of groundwater is not away from the evils of modernization and therefore, quality of groundwater is deteriorating due to pollutant contribution from septic tanks, land fill leachates, domestic sewage, agricultural runoff and industrial wastes. Contamination of groundwater also depends on the geology of the area and it is rapid in hard rock areas especially in lime stone regions where extensive cavern systems are below the water table. This is a feature common, not only in developed countries but also in developing countries like India, China, and South Africa. The changes in quality of groundwater respond to variation in physical, chemical and biological environments through which it passes. Further, the quality of groundwater mainly gets deteriorated due to seepages from unlined sewerage lines and effluent channels. The impact of urbanization on groundwater regime within a specific urban area depends both on its geographical location and the economic status of the city or even the country. Water flowing through the unlined sewage drain as well as from septic tank is enriched with a variety of organic compounds. If the drain is not properly lined, the liquid waste percolates through the sub-soil and reaches the groundwater table and contaminates the groundwater. In India, most of the communities in urban and sub-urban are depending on groundwater as a source for both drinking purposes/domestic purposes.

In the present study, quality of groundwater for nitrates and phosphates along with other drinking water quality parameters such as pH, electric conductivity, turbidity, alkalinity, sulphates, chlorides, hardness and fluorides were analysed. The groundwater quality at places in Bangalore has polluted with higher nitrate and phosphorous concentrations. In view of this, in the present study an attempt has been made to assess the groundwater quality for nitrate and phosphorous concentrations in the groundwater in two residential areas of Mysore city, one area is partially sewerred (Naidunagar) and the other area is completely sewerred (Saraswathipuram). A total of 14 bore well water samples were collected from both the study areas to assess the drinking water quality. The water samples were analyzed for physico-chemical and bacteriological characteristics as per the procedures prescribed by APHA (1998). Groundwater samples were collected and analysed during February 2013 to June 2013. Groundwater samples

were collected before and after the rain and the analysis results were compared to assess the groundwater quality status in both the study areas. The results showed that the concentration of nitrates in the groundwater was in the range between 0.08 and 0.6 mg/L in Naidunagar and, 0.001 and 0.691 mg/L in Saraswathipuram which are well within the limits specified by BIS 10500 (1991). However, in Naidunagar phosphates concentrations were found to be very high reaching a maximum value of 5.6 mg/L indicating that groundwater is unfit for drinking purpose. In Saraswathipuram, phosphates concentrations before rainfall was detected, whereas, after rainfall phosphates got introduced into the groundwater and reached a maximum concentration of 3.03 mg/L, which is greater than (0.1 mg/L) the limits prescribed for drinking purpose. The increase in phosphorous concentration may also be due to intrusion of lake waters in to the groundwater aquifers of the area. Infact the concentration of phosphates in lake water was found to be as high as 16.74 mg/L. Further, shallow bore wells were more susceptible to pollution from nitrates and phosphates compared to deeper bore wells. In Naidunagar, the sample points that were closer to the main drain depicted higher concentrations of phosphorous which suggests the possibility of leakage from the main sewer drains. Hence, it can be reported that the unsewered areas are more prone to pollution from nitrates and phosphates than in completely sewerred areas.