ABSTRACT

In Karnataka, groundwater is the main water source for domestic and agricultural uses. An understanding of the chemical evolution of groundwater provides insight into the interaction of water with environment and contributes to better resource management. Water quality in rural areas is still very poor. The present research work reports on the results of water quality in the rural areas of Karnataka. Two hundred and thirteen water samples from borewells, open wells and tap waters from 15 districts were collected. The Physico-Chemical parameters, trace metals (Cadmium, Chromium, Manganese, Zinc, Copper, Iron and Lead) and total Coliforms were determined by employing Standard Methods (APHA, 1976; Trivedi & Goel, 1986). The major ion concentration data has been processed using the HYCY- basic Computer program developed by Balasubramanian et al., (1991). The results were compared with WHO, ICMR and BIS standards. The analytical results of the present study area show that a large number of sample's Physico-Chemical and Heavy metals properties were well within the permissible limits. A few samples from Hassan district show higher concentration of Chloride, Fluoride, Nitrate, TDS, EC, Calcium, Magnesium and pH, which are higher than the permissible limits. Heavy metals are generally low for the present study water samples. Large numbers of trace metals are well within permissible limits and some others are below the detectable levels. Some of the samples have objectionable bacterial Coliforms. One of the samples from Chamarajnagar District was found to contain very high bacterial Coliforms (more than 100/100 ml), which is not suitable for drinking purpose.

The hydrogeochemical facies of groundwater with reference to Hardness, Salinity, Sodium hazard, etc. are studied to assess the nature and utilization of water for domestic and agricultural purpose. Geochemical graphic analysis method (Piper Trilinear Diagram) has been widely used for ground water studies. According to Sodium Adsorption Ratio Classification, 90 percent of water samples are in excellent type. Most of the samples have corrosivity ratio less than 1 epm. But 10% percent of samples from Mysore district and Hassan district are found to be in fair type. 95% of the samples in the study areas are found under C1S1, C1S2 C2S1, C3S1, C3S2 and C3S3 (USSL classification). The results can also be used for evaluating the groundwater quality for domestic, irrigation and agricultural purposes. Descriptive statistics, Cluster and Correlation analysis were used to obtain an understanding of Hydrochemical process of waters in present study areas. All the major ions considered show high correlation among themselves. TDS and EC are positively and significantly correlated with all the major ions. It is important from the study, to confirm that a large numbers of samples are suitable for safe drinking and irrigation purposes.