Delineation of groundwater contamination zones using Factor analysis in semi-arid region

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The chemistry of groundwater depends on geogenic and anthropogenic activities. An attempt has been made to study the impact of these processes and to determining their spatial influence using the Factor Analysis (FA). The Pageru River Basin (PRB) is located in Cuddapah basin, having an area of about 480Km². A total of 99 groundwater samples almost evenly distributed were analyzed for 12 different water quality parameters viz., pH, TDS, EC, Sulphate, Chloride, Sodium, Potassium, Calcium, Magnesium, Silica, Bicarbonate and Carbonate. The water quality data were subjected to factor analysis, which resulted in four major factors, for both Pre and Post-monsoon seasons respectively. The present study reveals that FA is a reliable method for differentiation of geogenic and anthropogenic activities.

Keywords: Factor analysis, groundwater chemistry, geogenic, anthropogenic, Pageru river basin