



# Evaluation of Ground Water Quality and Suitability for Irrigation in Nathusari Chopta Block of Sirsa District (Haryana, India) using Geo-informatics

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**Abstract:** The study area was fall under semiarid climatic condition where groundwater serves as the most consistent source of water for their domestic and agricultural activities. Seventy eight groundwater samples were collected and analyzed for pH, electrical conductivity (EC), anions ( $\text{HCO}_3^-$ ,  $\text{CO}_3^{2-}$ ) and cations ( $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$  and  $\text{Na}^+$ ). From the results of the analyses and measurements, the suitability of the groundwater for irrigation were evaluated based on the EC, sodium adsorption ratio (SAR), permeability index (PI), residual sodium carbonate (RSC), Kelly's ratio (KR) and US salinity laboratory diagram. The interpolation technique of geospatial technology was also used to evaluate and mapping of spatial changeability of EC, pH, SAR, RSC and groundwater quality, which provide first-hand information about the quality of groundwater. The analysis of above cites phenomena showed that the EC of groundwater ranged from 450 to 16300  $\mu\text{s}/\text{cm}$  and 61.04% of the samples fall under unsuitable and 25.97% under doubtful category respectively. These unsuitable and doubtful categories were more prominent in central, North-east and West as rising trends in the area and occupied 72.91% and 26.31% area of study area, respectively. The central and western part of area is most affected by this groundwater quality and most of the area suffers from waterlogging and soil salinity. As per US salinity diagram the groundwater of the area falls within the high salinity-low sodium hazard and medium salinity-low sodium hazard classes. Regarding the indices viz. RSC, SAR, PI and KR, the results showed that more than 90% of the samples were found to be within the safe limit and likely suitable for agricultural irrigation purposes. The major aim of the study was to find out pre-treatment and monitoring of the studied samples if they were to be utilized for irrigation. One option is to beat this issue to grow salt tolerant crops.

**Keywords:** Groundwater quality, Geospatial technology, Anions, Cations, SAR, KR, RSC

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