Abstract

Due to geographical location and placement in low latitudes away from the effects of the Mediterranean frontal area, Zahedan Plain has less moisture than the other parts of the country and therefore is always at the risks and complications of drought. For this study, data from specifications and location of wells and water quality statistics, including anions, cations, EC, SAR, TH and pH from 14 wells in 2002 - 2013 were used. For quantitative research of groundwater, 13 piezometric water level statistics wells, for this period were selected. For determining the start and end of the drought period, rainfall statistics of Zahedan synoptic station in 1981-2013 and drought Standardized Precipitation Index (SPI) and rainfall of normal (PN) was used. The results of the SPI showed that Zahedan plain in the years 2002, 2003 and 2004, except last quarter have dry conditions and relatively normal conditions in the years 2012-2005. Results showed PN index is more diverse, but for drought study and its impact on groundwater resources is not efficient. Aquifer Hydrograph investigation showed water table in the aquifer increased 1.37 meters in the years (2002-2003 to 2013-2014) with drought conditions due to the transfer of water from Sistan Chanimeh to Zahedan city. four Top Model semivariogram spherical, exponential, linear and Gaussian assessment and choosing for selection the best method to estimate the groundwater quality parameters for zoning of each chemical parameters during normal and dry years. The best method of estimating Selected and maps of groundwater chemical parameters was produced using it. Temporal and spatial quality monitoring data shows increase in all quality parameters. Sharp decline in groundwater quality can be associated with Evaporate sediments and quality reducer in aquifer ingredients sediment and also lakes existence in the surrounding aquifer also aquifer saline formations containing gypsum and salt. The results of correlation between water quality and SPI index showed, significant correlation at the %5 level between TDS and Anion with SPI and significant correlation is at %1between Na+ with SPI. Determine the type of water using Piper diagram showed that the type of water in dry periods is three types of sodic chloride, calcic chloride and sodium sulfate and in the normal periods is two types of sodium chloride and sodic bicarbonate. Schoeller diagram and Wilcox showed that drought has not significant impact on groundwater class for drinking and agricultural use.

Keywords: groundwater quality, aquifer unit hydrograph, drought indices, Zahedan plain

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