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Irrigation Water Quality Assessment using Principal Component Analysis of Hydrological Data from Parakai Lake, Tamil Nadu, India

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Abstract: The principal component analysis (PCA) applied in this study to define the parameters like EC, TDS, Na, SSP, SAR, RSC, Boron of shallow water quality data groups were obained from the Parakailake, Tamil Nadu, during north east monsoon and hot weather times. The water quality parameters were taken for two seasons from the four stations. The lake water was polluted by residential discharge and small scale industries located nearby the city and the villages. The PCA produced three significant main components such as correlation matrix generation, find out the correlation coefficient and extracted factors are rotated and also explained 89.37 per cent of the variance in high flow periods and 92.49 per cent of variance in low flow periods; therefore there are major water pollution threats in the lake due to urbanization. To improve the water quality, the PCA technique is used to support assessment changes in detecting the significances like the electrical conductivity had a loading effect of 0.983 is directly correlated to ions in the water and also comprised of inorganic salts.

Keywords: Data treatment, Principal components analysis, Statistical packages, Water quality parameters