Rainwater quality has become one of the environmental concerns of the developing nations in recent times. The contributions of industrial operations embedded into various components of hydrological cycle reflects quality variations. A study on the time series variations of the rainfall quality from Visakhapatnam, a rapidly growing industrial city located on the east coast of India has revealed the impact of atmospheric pollutants from industry on the atmospheric surface and sub surface water resources. In addition the data has also provided critical information on the possible differentiation of ionic concentrations derived from sea sprays from those of the industry. It further represents an empirical assessment of the growth of industry vis-à-vis the contamination of water resources.

The rainwater quality from 1983 to 2003 reflects a steady increase in conductivity associated with a decrease in pH. The different segments of variation in EC and pH clearly reflects a comparable growth in industry in the vicinity. Further specific indicators like absolute values of ionic concentrations like \( \text{SO}_4^{2-} \), \( \text{NH}_4^+ \), \( \text{NO}_3^- \), \( \text{Ca}^+ \), \( \text{Na}^+ \) and \( \text{Cl}^- \) along with ratios of \( \text{Ca}^+ + \text{NH}_4^+ \) and \( \text{NO}_3^- + \text{SO}_4^{2-} \) indicate the possible threat from acidic rains in the region. However, due to significantly large contamination levels from industrial effluents has created a constraint to quantify the individual contamination levels on ground water resources due to fluxes from rainfall and industrial effluents.