Evaluation of Water Quality Status in Coastal Aquifers – A Case Study along the East Coast of Andhra Pradesh, India Using in situ and Arc/Info GIS Techniques

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The objective of the research paper is to evaluate the ground water quality status in coastal aquifers using insitu and GIS techniques. For this study, area selected is along the East Coast at Nellore where the Pennar river confluence Bay of Bengal. A total number of hundred samples are collected at pre-determined sampling locations keeping the identification of zone of variation in water quality. All the hundred water samples are analyzed for fourteen water quality parameters, namely pH, conductivity, salinity, alkalinity, chlorides, fluorides, hardness, sodium, potassium, nitrates, phosphates, sulphates, magnesium and sodium absorption ratio. The data obtained from this analysis are then projected on a map and a cartographic output has been prepared. This cartographic (paper based map) output is then scanned, digitized and a digital database is created using AutoCAD and Arc/Info software packages. A landuse / landcover map of this study area is also developed using digital analysis of satellite data. Maps showing the spatial distribution of all the fourteen water quality parameters are also prepared. All these maps are then integrated with land use/land cover data layer using overlay analysis of Arc/Info. Cursory examination of this overlaid map is performed for correlation study. The correlation study revealed that the indiscriminate pumping and over exploitation of ground water for aquaculture practices might result into seawater intrusion and Remotely sensed data is found to be effective for determining the concentrations or distributions of water quality parameters in both inland and offshore water bodies. The movement of salt water and fresh water was studied for a problematic ground water pumping pattern using a model (Vertical Cross Section Solute Transportation Model). It is estimated that interface could move about 5 to 10 km in that region which are presented in this paper with relevant tables