Review of: "Saltwater Intrusion in Coastal Aquifers: A Comprehensive Review and Case Studies from Egypt"

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The review article is focused on direct saltwater ingress in the coastal region. The principles and mechanisms of seawater intrusion, different methods to investigate seawater intrusion in the coastal tract, and different recharge techniques to control seawater intrusion in the coastal region are elaborately discussed. The article also deals with the limitations in these techniques. A good review indeed, as far as direct seawater ingress is concerned, and I appreciate the efforts taken by the authors.

At this juncture, I would like to add some more information on the enhanced salinity in coastal groundwater sources. Being a review article, my emphasis was to highlight the potential use of the stable isotope technique where multi-faceted salinity problems occur in the coastal region. In many parts of the world, anthropogenic activities like discharge of industrial effluents through the backwaters, coir retting (processing of coconut husk for coir fibre extraction) in the backwaters near the sea mouth, clay mining activities where iron pyrites pose water quality problems in groundwater, will complicate the salinity problems in coastal aquifers. These are all location-specific problems where direct seawater ingress is already present. Other sources of salinity in the region could not be mistaken for direct seawater ingress. Hence, identification of the exact origin/source of the pollutant is of prime importance to undertake appropriate remedial measures. In this context, the stable isotope technique is of immense use. Environmental stable isotopes such as ^{2}H, ^{13}C, ^{18}O, ^{34}S, ^{37}Cl are quite helpful in discriminating the exact source of salinity.

A project was undertaken around a china clay mining area in Kerala, India. Here, open shallow wells are a prime source of groundwater. This area was already under the influence of seawater ingress, especially during the summer months. Excess salinity due to high chlorides and sulphates was observed to be the main cause of salinity. Wells predominantly influenced by direct seawater ingress and those contaminated by clay mine effluents were discriminated using the sulphur-34 isotope technique.

The combined sulphur and oxygen isotopic composition of sulphates is effective to distinguish the different sulphate sources, whereby the exact origin of a specific pollutant can be identified.