

EGU21-16357

<https://doi.org/10.5194/egusphere-egu21-16357>

EGU General Assembly 2021

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Characterizing ground water salinity in Coastal Bangladesh by using observations and perception-based information

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Salinity intrusion has become a serious threat to coastal areas worldwide, with severe effects on human health, agricultural production and ecosystem services. Coastal populations of Bangladesh, as with many other countries, are living with and experiencing rising salinity in drinking water on a daily basis. Water quality management requires reliable data based on continuous monitoring of freshwater at any abstraction source. However, such monitoring is costly and unavailable in most of the coastal areas of Bangladesh. Several perception studies based on semi-structured interviews have shown a strong potential to support environmental monitoring but inadequate for decision-making. Therefore, we attempted to capture state of water salinity through people's experiences lenses, self-reported perception, and measured salinity. The overall objective of this study is therefore to evaluate if the perception of coastal inhabitants in Bangladesh adequately describes salinity loads in drinking water in space and time. In this paper, we are going to describe spatial and temporal variation of drinking water salinity in a coastal delta of Bangladesh. In addition, to present the analysis of self-reported perception on salinity in drinking water in comparison to measured actual salinity of tube-well water. Our initial analysis shows that there is a large spatial variation of salinity in drinking water but no seasonal variation. In addition to that, we found that salinity loads are differing with tube-well depths. The majority of the interviewed people were able to report salinity in drinking water when it was also measured, although with some mismatch between measured and perceived salinity. This might influenced by taste adaptation to salt and other socio-cultural factors.

The results suggest that our interdisciplinary approach is useful to explore the state of drinking water salinity in coastal areas, water consumption practices of the coastal community and we concluded that regular water quality monitoring along with people's perception studies could better support the decision-making related to coastal water management.